

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

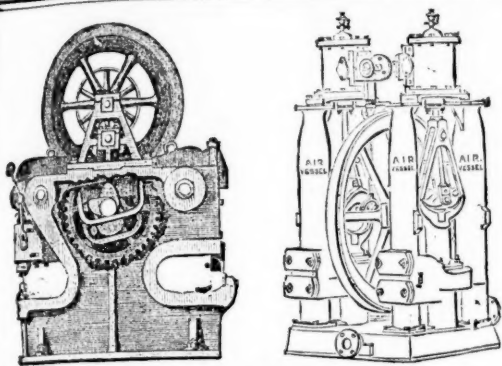
FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2025.—VOL. XLIV.

LONDON, SATURDAY, JUNE 13, 1874.

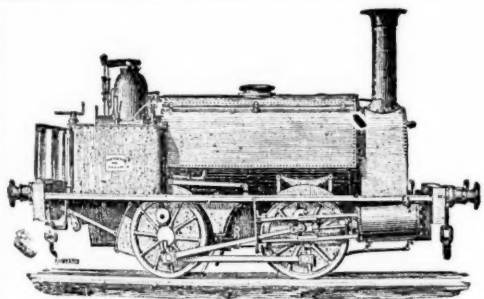
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PUNCHING MACHINE, BAR SHEARS, AND RAIL
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FOR CONVEYING FIRE TO THE
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Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1851; at
the "INTERNATIONAL EXHIBITION" of 1862, in London; at the "IMPERIAL
EXPOSITION," held in Paris, in 1855; at the "INTERNATIONAL EXHIBI-
TION," in Dublin, 1865; at the "UNIVERSAL EXPOSITION," in Paris, 1867;
at the "GREAT INDUSTRIAL EXHIBITION," at Altona, in 1869; and at the
"UNIVERSAL EXHIBITION," Vienna, in 1873.

BICKFORD, SMITH, AND CO.,
OF TUCKINGMILL, CORNWALL; ADELPHI
BANK CHAMBERS, SOUTH JOHN STREET, LIVER-
POOL; and 85, GRACECHURCH STREET, LONDON.
E.C. MANUFACTURERS AND ORIGINAL
PATENTERS OF SAFETY-FUSE, having been in-
formed that the name of their firm has been attached to
fuse not of their manufacture, beg to call the attention of
the trade and public to the following announcement:—
EVERY COIL OF FUSE MANUFACTURED by them has TWO SEPARATE
THREADS PASSING THROUGH THE COLUMN OF GUNPOWDER, and BICK-
FORD, SMITH, AND CO. CLAIM TWO SUCH SEPARATE THREADS AS
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For Excellence
and Practical Success
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Represented by
Model exhibited by
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ENGINEERS AND GENERAL MERCHANTS,
HAYLE, CORNWALL,
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AND 120, GRESHAM HOUSE, E.C.

MANUFACTURERS OF
PUMPING AND OTHER LAND ENGINES AND MARINE STEAM ENGINES
the largest kind in use, SUGAR MACHINERY, MILLWORK, MINING
MACHINERY, AND MACHINERY IN GENERAL.
SHIPBUILDERS IN WOOD AND IRON.

SECONDHAND MINING MACHINERY FOR SALE.
In First-Rate Condition, at Moderate Prices.
PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES
STEAM CAPSTANS; AND CRUSHERS of various sizes. BOILERS, PIT
WORK of all descriptions, and all kinds of MATERIALS required for
MINING PURPOSES.

THE PATENT PNEUMATIC STAMPS
May be SEEN AT WORK at HAYLE FOUNDRY WHARF, NINE ELMS,
by previous application at either of the above addresses.

OSLER'S CRYSTAL GLASS CHANDELIERS,
TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORNOLU.
Moderate Lamps and Lamps for India.
LONDON.....SHOW ROOMS, 45, OXFORD STREET, W.
BIRMINGHAM.....MANUFACTORY AND SHOW ROOMS, BROAD STREET
(ESTABLISHED 1807.)



PARIS.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH.

McKEAN'S ROCK DRILL,

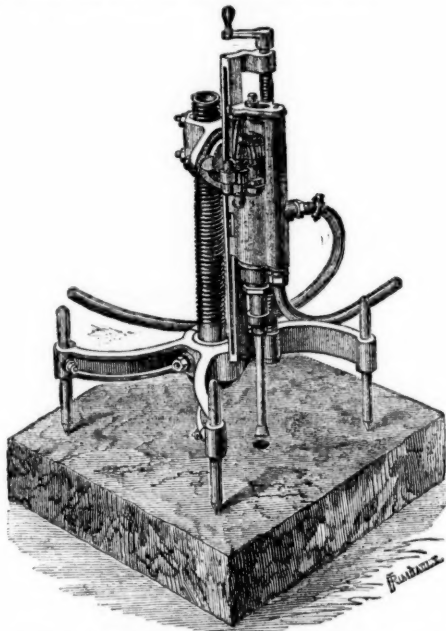
ADAPTED TO EVERY CLASS OF ROCK BORING.

SIXTY MACHINES

FURNISHED FOR THE

ST. GOTHARD TUNNEL OF THE ALPS.

IN USE AT THE ST. JOHN DEL REY MINES, RIO TINTO
MINES, TRIESTE HARBOUR WORKS, ALEXANDRIA
HARBOUR WORKS, AND IN VARIOUS TUNNELS,
MINING AND QUARRY WORKS, DEEPENING RIVER
BEDS, STONE-CUTTING AND CONTRACTORS' WORK
OF VARIOUS KINDS, WELL-BORING, &c.



McKEAN'S ROCK DRILL has the following
ADVANTAGES over ALL other MACHINES, viz.:

- 1.—It is the simplest in construction, and contains the fewest parts.
- 2.—No duplicate parts whatever require to be furnished with machines.
- 3.—Greater durability, on account of its superior mechanical construction.
- 4.—It is the most powerful, and runs at greater speed than any other, without liability to derangement or breakage.
- 5.—Greater facility of manipulation in its adaptation to various kinds of work.

MANUFACTURED FOR McKEAN AND CO. BY
MESSRS. P. AND W. MACLELLAN, "CLUTHA IRONWORKS,"
GLASGOW;
MESSRS. VARRALL, ELWELL, AND MIDDLETON, AND MESSRS.
SAUTTER, LEMONNIER, AND CO., PARIS;
AND E. REMINGTON AND SONS, NEW YORK.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,
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LONDON.

COPY OF LETTER FROM SIR GEORGE W. DENYS, BART.

Draycott Hall, Richmond, Yorkshire, May 11, 1874.
DEAR SIRS,—Messrs. Jeffrey and Nevill, of the Lead Hills Mining Company, came

here from Scotland last week to see the borer at work in Sir Francis level. They
went back highly pleased with what they saw. The level, which is just now going
at 47 per fathom, they stated could not be moved at Lead Hills for less than £15.
Five holes, between 6 ft. and 7 ft. deep, had been bored during the shift, and were
fired together with 50 charges of dynamite, getting, as you may suppose, a tre-
mendous quantity of stuff, and filling the level right up to the roof.
The old machine has been working first rate since you repaired it, and seems as
good as ever. I think you will be hearing from Lead Hills before long, for seeing
is believing. You can make any use of this you like.
Messrs. McKean and Co. Yours truly, GEO. W. DENYS.

CONDENSATION OF SMOKE & GASES.

HESLOP, WILSON, AND BUDDEN,
NEWCASTLE-UPON-TYNE.

This PATENT APPARATUS is EXCEEDINGLY SIMPLE and INEXPEN-
SIVE IN CONSTRUCTION, and is so arranged as may seem best for assisting
the substances to be operated upon.
AFFORDS TO MANUFACTURERS AND OTHERS PERFECT SAFETY
UNDER THE SMOKE AND GASES ACTS.

More effective than condensing towers.
Large chimneys can be done away with. Succeeds thoroughly in condensin
ammonia.
UTILISES ALL EMISSIONS.
OF GREAT VALUE IN SMELTING WORKS.

The Machine can be seen at work at—
JOHNSON AND HOBBS,
No. 11, CROSS STREET, MANCHESTER,
Of whom also all particulars can be had.

BLASTING WITH ELECTRICITY.

THE
ELECTRIC BLASTING APPARATUS COMPANY
CINDERFORD,
FOREST OF DEAN, GLOUCESTERSHIRE,
ARE NOW PREPARED TO SUPPLY
BRAIN'S HIGH-TENSION DETONATING FUSES,
ONE HUNDRED of which can be EXPLODED SIMULTANEOUSLY
with a SMALL DYNAMO-ELECTRIC MINE EXPLODER.
Prices and particulars free by post.

Duncan's Lubricating Oils and Greases

Warranted free from gumminess. Trials at our expense.
Pale INSTAR SPERM, OLIVE, and LARD, from 2s. 9d. to 3s. 9d. per gallon.
Improved "DON ECONOMIC" OIL, 30 per cent. cheaper than the
ordinary kinds.
TROLLEY WHEEL NECK GREASE and CYLINDER OIL.
Beware of worthless imitations. Agents Wanted. Particulars from
DUNCAN BROTHERS, Sole Manufacturers,
2, BLOMFIELD STREET, LONDON, E.C.

MINERS' LAMP

AND
GAUZE MANUFACTORY,

Established Half-a-century.

JOSH. COOKE AND CO. J.C.B. TRADE MARK.
SAFETY LAMPS

MADE TO DRAWING, DESCRIPTION, or MODEL. Illustrated
Price Lists free, by post or otherwise.
VALUABLE TESTIMONIALS FROM EMINENT FIRMS.
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RAILWAY SPRING COMPANY,
MILLSANDS, SHEFFIELD,
MANUFACTURERS OF EVERY DESCRIPTION OF
RAILWAY SPRINGS.



By a special method of preparation, this leather is made solid, perfectly close in
texture, and impermeable to water; it has, therefore, all the qualifications essen-
tial for pump buckets, and is the most durable material of which they can be made.
It may be had of all dealers in leather, and of—

I. AND T. HEPBURN AND SONS,
TANNERS AND CURRIERS, LEATHER MILLBAND AND ROSE PIPE
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LONG LANE, SOUTHWARK, LONDON
Prize Medals, 1851, 1855, 1862, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.



THE "KAINOTOMON" ROCK DRILL,

The SIMPLEST, CHEAPEST, and BEST Machine in the World for SINKING, MINING, and QUARRYING,



Is extensively used at the principal Mines, Collieries, and Quarries of Great Britain, and the Continent of Europe.

"To this invention, which appears to possess several advantages over the machines previously exhibited at Falmouth, the Judges are unanimous in awarding a first-class silver medal" (the highest award).—*Report of the Judges at the Royal Cornwall Polytechnic Society's Exhibition, 1873.*

"The boring machine works splendidly."—W. TORRANCE: *Mil-Cadder.*

"For simplicity, compactness, and performance of work, your drill excels all others."—JOHN MAIN: *Crossfield Ironworks.*

"Under the most difficult circumstances, they give every satisfaction."—G. GREY: *Montreal Iron Mines, Cumberland.*

"The simplest and best boring machine."—Capt. WASLEY's letter to the *Mining Journal*, Oct. 18, 1873.

"It gives every satisfaction."—W. E. WALKER: *Lord Leconfield's Iron Mines.*

"The rock-drill I bought of you seven months ago has given me entire satisfaction, and I am convinced that the 'Kainotomon' is the best rock-drill in the market."—P. McGINNIS: *Strabane.*

"I am quite satisfied with the working of it. For sinking pits it is a first-rate invention; I can do as much boring with it myself as six men can do by hand."—S. JENKINS: *South Wales Colliery Company.*



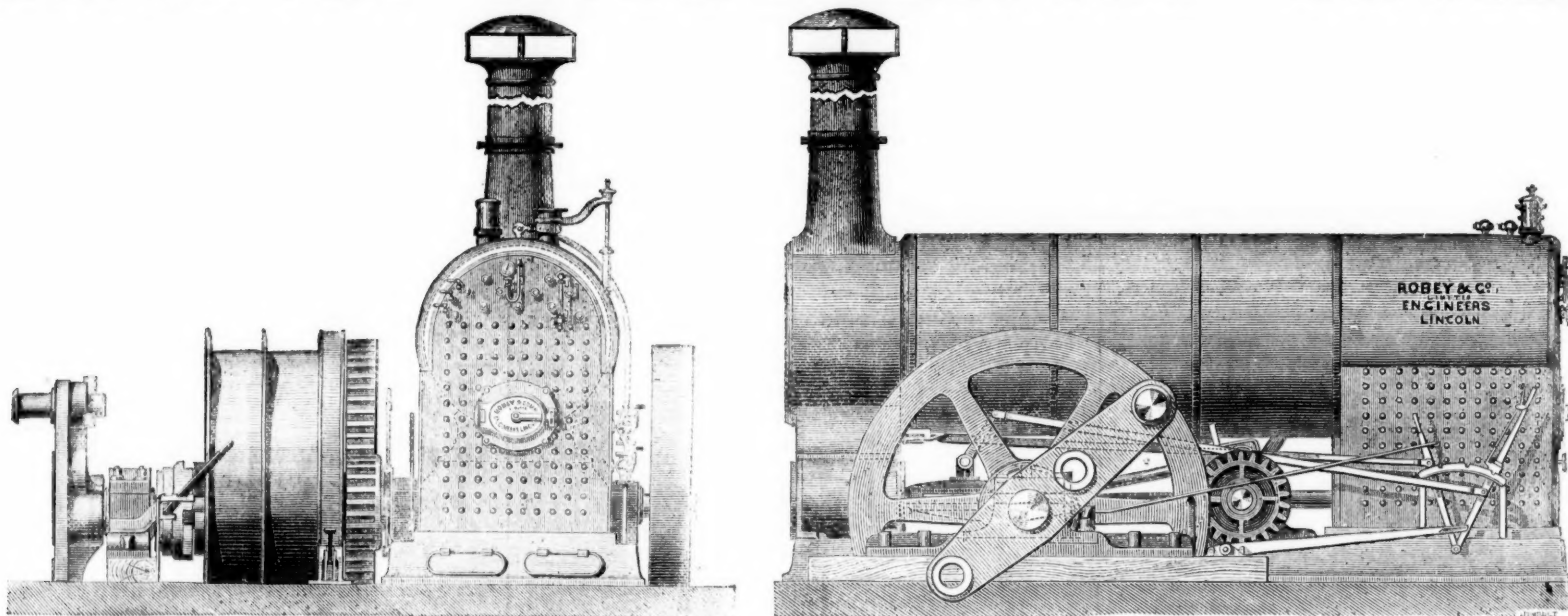
The advantages over other Rock-boring Machines claimed for the "Kainotomon" are—

- 1.—It is much shorter.
- 2.—It is much lighter, and more readily removed from place to place.
- 3.—It requires the turning of ONLY ONE, instead of a number, of set screws, to fix it in position at any angle.
- 4.—It may be fed 3 inches out of stroke, without stopping the working of the drill, an invaluable advantage.
- 5.—It is not liable to derangement.
- 6.—It has not one-third the number of parts in its construction.
- 7.—All stuffing-boxes and parts requiring adjustment are dispensed with.
- 8.—It is so simple in its construction that any ordinary labourer or miner can drive it, simply having to turn on the motive power and feed the drill.
- 9.—The rotation is compulsory, and regular.
- 10.—40 lbs. pressure only is required to work it.
- 11.—A saving of over 50 per cent. in iron and flexible piping.

"THE ECONOMIC" COAL-CUTTERS, AIR COMPRESSORS, BOILERS, &c.

THOS. A. WARRINGTON, 30, KING STREET, CHEAPSIDE, LONDON, E.C.

THE PATENT IMPROVED ROBEY MINING ENGINE.



Some of the advantages of this New Patent Engine are as follows:—

- SMALL FIRST COST.
- SAVING OF TIME AND EXPENSE IN ERECTING.
- EASE, SAFETY, AND ECONOMY IN WORKING.
- GREAT SAVING IN FUEL.

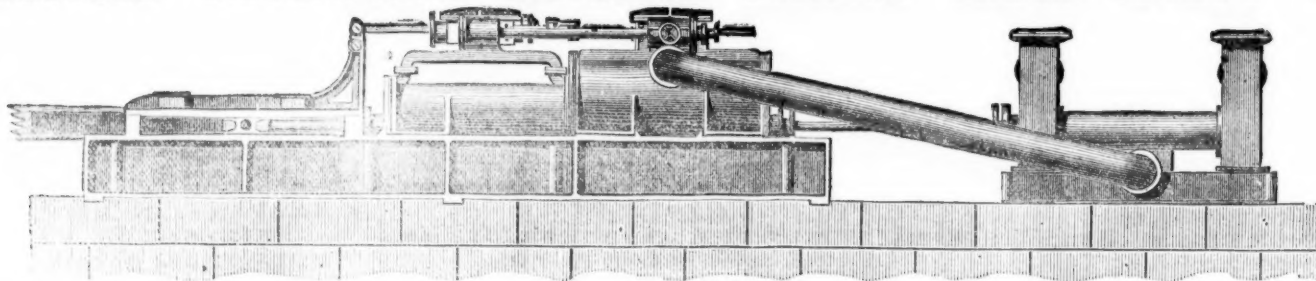
This New Patent Mining Engine is free from all the objections that can be urged against using the Semi-Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable, in saving time and expense in fixing.

ENGINES UP TO 200 EFFECTIVE HORSE-POWER ALWAYS IN PROGRESS.

Prices and full particulars on application to the sole manufacturers:—

ROBEY AND COMPANY, LIMITED,
PERSEVERANCE IRONWORKS, LINCOLN, ENGLAND.

HATHORN, DAVIS, CAMPBELL, AND DAVEY,
MAKERS OF
THE COMPOUND DIFFERENTIAL EXPANSIVE PUMPING ENGINE—DAVEY'S PATENT.



Also, Single-cylinder Condensing Differential PUMPING ENGINES; Steam Pumps, of various kinds; Hydraulic Pumps, for dip workings; Winding Engines; Compound Rotative Engines; the Separate Condenser; High and Low Pressure Steam Boilers, &c.

SUN FOUNDRY, LEEDS.

FURTHER PARTICULARS ON APPLICATION.

BENNETTS' SAFETY FUSE WORKS,
ROSKEAR, CAMBORNE, CORNWALL.

BLASTING FUSE FOR MINING AND ENGINEERING PURPOSES.

Suitable for wet or dry ground, and effective in Tropical or Polar Climates.

W. BENNETTS, having had many years experience as chief engineer with Messrs. Bickford, Smith, and Co., is now enabled to offer Fuse of every variety of his own manufacture, of best quality, and at moderate prices.

Price Lists and Sample Cards may be had on application at the above address.
LONDON OFFICE,—H. HUGHES, Esq., 55, GRACECHURCH STREET

ENGINEERS' TOOLS, LATHES, DRILLING MACHINES, LIFTING JACKS, HOISTING CRABS, HORIZONTAL STEAM ENGINES, &c., IN STOCK.

W. H. PEARSON, 50, ANN STREET, BIRMINGHAM.

Catalogues



on application.

Original Correspondence.

THE EMMA SILVER MINING COMPANY.

SIR.—A correspondent, signing himself "H. N.," in last week's *Mining Journal*, has committed so many errors in his letter that I cannot allow them all to go uncontradicted. In one place "H. N." states, "As regards the mine, Mr. Attwood tells us of 'enormous states,' consequently there must have been enormous returns to pay outlay," but shows in page 6 of the report that the profit from March, 1873, to March, 1874, was \$131,046.53 (dollars), a sum representing over 25,000,000 in English money.

"H. N." then states that "the great outlay is caused by the mine being so badly worked." Mr. Clarence King, Mr. E. S. Blackwell, Prof. A. Murray, and other mining authorities of note having reported on the mine, and approved of the plans adopted by myself in working the same, proves that "H. N." is evidently incompetent to express any such opinion as the above.

"H. N." states, "We have 2000 ft. on the run of the vein, so if we only explore 20 ft. we are not likely to make discoveries. The rule is that in a productive mine the expenditure in exploring should amount to one-half." Again I must contradict "H. N." and show him incompetent to set himself up as a judge of mining operations. If "H. N." had any practical knowledge of the subject he attempts to write about he would have seen by looking at plan No. 3 (report April 30, 1874) that the course of the Emma deposit (not vein) is almost at right angles to the patented ground; also he would plainly see in "the horizontal section at floor No. 7" (in plan No. 2) that the greatest length of vein matter has never exceeded 310 ft., and he will also learn, by a careful perusal of my report of April 30, that explorations have been carried on to a much greater length than 20 ft. It is also a well-known fact that there cannot be any established rule for expenditure in exploring, either for a productive or unproductive mine, that will apply to all parts of the world in which mines are now being worked, so "H. N." again shows his great ignorance of mining matters.

"H. N." then states, "A year hence we shall find ourselves with an empty shell, because in miner's language Mr. Attwood has been picking the eyes out of the mine." Again "H. N." shows what little he really knows of the subject he attempts to write about, as he states in the commencement of his communication, "I purchased latterly 100 shares in this mine at a low figure." By this it would seem he could not have read my report on the Emma Mine, dated March 25, 1873, or if he had read it that he is wanting in ability to understand plain English, as the above report was published to the shareholders, and showed plainly that the mine then contained but a small amount of pay ore.

"H. N." further states, "The engine invented by the same gentleman does not serve its purpose, because the bottom of the mine is flooded." Again, I must correct "H. N." I never invented an engine, but with the aid of Mr. W. J. Silver constructed a mining pump on a new plan, which has been most successful as well as economical. Also the bottom of the mine is not flooded with water, nor ever has been, through any deficiency of the new pump.

"H. N." states, "Prof. Clayton in his report on the Davenport mine distinctly states, that there is no difficulty in finding the Emma vein in depth; he is considered the first American authority on the limestone formation from his geological surveys." Again, "H. N." shows his ignorance of the subject he has attempted to write upon. I am personally acquainted with Mr. J. E. Clayton, M.E. (not professor, and who does not care to be dubbed as such), and "H. N." does great injustice to such eminent men as Prof. Whitney, Prof. Dana, Mr. Clarence King, and numerous others, when he calls Mr. Clayton "the first American authority on the limestone formations," &c. Mr. C. King has made a report contrary to that you state Mr. Clayton has expressed, such a decided opinion about finding the Emma vein; also Mr. Clayton has not been inside or examined the mine for the last 18 months.

I shall decline any further discussion on the above subject with any individual who shows such an utter lack of knowledge of the subject he attempts to treat upon as your correspondent "H. N.," and who, while writing with the object of misleading the public, has not the manliness to sign his name to the document.

Emma Office, Victoria-buildings, June 10. GEO. ATTWOOD.

AUSTRALIAN TIN.

SIR.—Anticipating that my previous letters have been received and are not unwelcome, I forward by this mail the account of tin ore sent from the mines during the month of March, and also the quantities of tin and tin ore cleared at the Customs during the month. You will notice that the quantity of tin is increasing in proportion to the ore shipped, and also that the yield from the mine in the month is a little in excess of that of last month, so the low price of tin has not yet affected the production of it.

I append the following cuttings from the local papers, as affording information on the state of tin mining here:—

From the *Sydney Morning Herald*, March 20.
SYDNEY TIN COMPANY.—Manager reports that the yield of ore last week was 5 tons, making the quantity on hand ready for dispatch 7½ tons. Number of men employed, 46; number of sluices at work, 5. All this company's ore is now being smelted prior to shipment.

KNOXMAN'S GOLD MINING COMPANY.—Under date March 18, the mining manager reports as follows:—"Shaft sunk this week 3 ft., making a total depth of 37½ ft. Quartz raised this week 3 tons, making a total of 33 tons."

WHEAT JOHNSON TIN MINING COMPANY.—Manager reports that "last week's yield of ore was 5 tons 15 cwt., and that 61 cwt. was dispatched to Sydney. All this company's ore is now being smelted prior to shipment."

THE BIG RUBY TIN COMPANY.—Manager reports that "last week's yield of ore was 3 tons, and that 92 bags, weighing about 4½ tons, were dispatched to Sydney, leaving about 1 ton on the mine. Number of men employed, 29; number of sluices at work, 6. The ground is now looking much better, and increased yields are expected. All this company's ore is now being smelted prior to shipment."

THE TUNGSHAN TIN MINING COMPANY.—The manager reports that "the quantity of ore raised last week was 3 tons 12 cwt., and that 81 bags, weighing about 4½ tons were dispatched for Sydney, leaving 3½ tons on hand. Number of tributaries at work, 3; number of sluices at work, 5. All the company's ore is now being smelted prior to shipment."

From the *Sydney Morning Herald*, March 23.
EISENBERGER'S NEW BANCA TIN COMPANY.—The following telegram was received this day from the mining manager:—"Washed this week, 3 tons 12 cwt.; dispatched 5 tons."

GREAT DIVIDING RANGE TIN COMPANY.—The manager reports that "the yield of ore for the past fortnight has been 3 tons 17 cwt., and that 80 bags, weighing 4 tons, have been dispatched for Sydney, leaving about 1 ton on the mine. All this company's ore is being smelted prior to shipment."

RUBY TIN MINING COMPANY.—The manager reports that "last week's yield of ore was 3 tons, and that 78 bags, weighing 4½ tons, were dispatched for Sydney. Number of men employed, 10; one sluice at work; ground still continuing very good. All this company's ore is being smelted prior to shipment."

Evening News, April 9.

The quantity of tin ore forwarded from Murrumbidgee Railway Station by W. E. Potts and Co., from March 25 to April 1 was 41 tons 13 cwt. 3 qrs. 17 lbs. The *Glen Innes Guardian* of the 4th inst. has been informed by a gentleman who is resident of the Table Land that things have much improved in that locality lately. Several very rich tin reefs have come to light, and the one being worked by the English Company at the Nine Mile is turning out very satisfactorily.

Within the tract of country known as the Upper Murray district, extensive mineral discoveries have from time to time been made, but these discoveries have not (says the *Hume Times*), as a rule, been followed up to advantage. Near the Murrumbidgee river, on the Ingleton run, cassiterite, or stream tin, has been found over an extensive area, and at Barra Creek, and, indeed, throughout the whole of the country stretching to the foot of the Australian Alps, tin, copper, and gold have been discovered in such quantities as have led to the impression that the deposits would pay for the working. At present considerable difficulty is experienced in procuring machinery and appliances, owing to the absence of roads and the mountainous nature of the country; but were a line of steamers to be placed on the river, we believe, with the facilities of transport would be very much lessened. A company provided that assistance is given by the Government towards removing the bars and snags that impede navigation. It is said that an expenditure of from 300,000 to

400,000 would render the river navigable for at least six months out of the twelve, and, considering the great amount of good that would result from this trifling outlay, the Victorian Government ought to take some action in the matter. A great impetus would be given to the development of the agricultural and mineral resources of the Upper Murray district by the opening of navigation on the upper river.

Cuttings from *Evening News*, same issue continued.

A correspondent of the *Glen Innes Guardian* writing from Vegetable Creek, observes:—"Since I wrote you last nothing of any great importance has occurred. Mining is proceeding pretty much the same for the past two months. At present O'Daly's claim is at the head of all the tin mines in this district. The ground is showing richer than ever. A tramway has been laid from the principal shaft to where the sluicing operations are being carried on. I believe the amount of ore raised is about 10 tons a week, the result of some 40 men's work. Taking this claim all in all, I believe I am justified in pronouncing it the first claim in Australia, that is as far as the stream is concerned. I do not speak of lodes which have not been tested as yet. The Rose Valley has changed hands since I wrote you last; Messrs. Ardern and Wesley being the purchasers at 10200. The work is going on as usual under the management of Mr. John Hynes, as in the O'Daly's claim a tramway has been constructed from the principal shaft to where sluicing is carried on. The yield is about the same per week as I wrote you last. Moore and Speare's claim is being worked vigorously, about 80 men are constantly at work taking out wash-dirt, and sluicing is going on every day. This ground is worked as it should be—a face right across the creek, so that the whole of the face, a system which is much better, and in the end much cheaper, than the style of poldocking, which in a great many instances is adopted, where no greater necessity for such a course exists. Hall's Vegetable Creek Claim: Three parties are at work on this claim: one party above the store, another below, under the management of Mr. Chandler, and the third party below the Rothschild, managed by Mr. Reynolds, all doing very well. The Rothschild: Two parties are at work on this claim, and as there is plenty of water they are doing very well. The Great Britain: Work is proceeding rather slowly on this claim. Two piddling machines have been erected, and no doubt will be the means of a considerable amount of tin being washed out when rains come, water being rather scarce at present. The great and somewhat sudden fall in the price of tin, I fear, will be the means of closing up some of the mines, or, at all events, the diminishing of the number of men employed. Still, unless it falls much lower, it will pay to work the principal mines in the neighbourhood, as in most cases the ore can be raised at a cost from 15s. to 30s. per ton, which at present quotations would leave a fair margin of profits for the proprietors. But of course some are never satisfied unless they clear 300 or 400 per cent. on expended capital. The adult who first died on the creek since the opening up of the tin mines occurred here last Sunday. An old man, named John Williams, who only arrived on the creek the Friday previous, and who was just about starting for Inverell, when he was taken suddenly ill, threw up a large quantity of blood, and died in a few minutes. No magistrate could be got to hold an enquiry, so he was buried on Tuesday. The weather here has been very fine for the last few months."

Sydney, New South Wales, April 10. C. E.

QUANTITIES OF TIN ORE FORWARDED DURING MARCH, 1874.

	Tons c.	qr.	lbs.	Tons c.	qr.	lbs.
March 5 Via Warwick	69	8	0	6		
12 Ditto	126	4	3	18		
19 Ditto	93	15	0	24		
26 Ditto	104	7	1	15= 393	15	2
March 5 Via Murrumbidgee	44	6	2	12		
12 Ditto	37	11	0	4		
19 Ditto	59	19	1	5		
26 Ditto	13	8	2	27= 146	5	2
March 5 Via Grafton	48	4	0	0		
12 Ditto	47	17	0	0		
19 Ditto	36	3	0	0		
27 Ditto	64	5	0	0= 196	0	0
Total	Tons 736 10 0					

QUANTITIES OF TIN AND TIN ORES CLEARED AT THE CUSTOMS FOR LONDON DURING MARCH, 1874.

	Tin.	Tin ore.
Agnes Rose	1297	688
John Duthie	1909	785
William Duthie	2500	125
Damascus	650	2060
Total	Cwts. 6256	Cwts. 3668

THE RETURNS FROM THE METALLIFEROUS MINES.

SIR.—In last week's *Journal*, in the remarks on the Rating of Lead Mines, you state that you have given the returns from the lead mines for 1872, "the returns for 1873 not being yet obtained, on account of the late date at which the Metalliferous Mines Act orders the return to be made." Allow me to inform you that I am using my best endeavours to obtain returns at an earlier date than Aug. 1, after which they will be sent to the Home Office by the Inspectors, and forwarded by the Secretary of State to the Mining Record Office, to be used in the compilation of the "Mineral Statistics."

If the managers and owners of our metalliferous mines will second my efforts by sending to my office their returns for 1873, with as little delay as possible, I hope to be enabled to place my annual volume at a much earlier date in the hands of the public than I can do if I am compelled to wait for the returns made to the Metal Mines Inspectors.

I am now in Cornwall on this especial purpose, and I intend, as soon as I have completed the returns from the tin and copper mines, to visit our lead mining districts. ROBERT HUNT, F.R.S.,
St. Ives, Cornwall, June 9. Keeper of Mining Records.

EXTRACTING SILVER AND COPPER FROM POOR ORES.

SIR.—I notice in last week's *Journal* a description of Mr. Barnard's method for extracting silver and copper from poor ores. Now, although as applied to the poor Cornish ores the process may be new, it certainly is not as regards the process itself, for it has been used by a relation of mine in Wales for the last three years for extracting silver and lead from an ore containing about 8 per cent. of lead and 12 ozs. of silver per ton, with ½ per cent. of copper. The process he uses is to grind the ore fine first, then calcine it—to drive off sulphur and oxidise the iron—then obtain the copper by chloridising it with muriatic acid, or roasting with salt, and then getting both lead, copper, and silver into solution by soaking it in strong brine, after which it is precipitated with iron, as usual. As some thousands of tons of ore have been treated in this way, I do not see that the process can be called a new one.

June 10.

QUICKSILVER IN EXETER.

SIR.—In a recent *Journal* one of your correspondents favoured us with a report of the discovery of native mercury, which had exuded from the rock upon which the City of Exeter is based. I have, however, failed to notice any further development of this apparently singular phenomenon, though I am a regular and somewhat careful peruser of your valuable *Journal*. As you may imagine, numerous parties have called my attention to this interesting fact, and have solicited my opinion upon the subject, whilst several have even expressed extremely strong opinions thereon, presuming this country on the verge of becoming self-sufficient in its supply of this highly important metallic element, in itself the main ingredient in obtaining from gold ores their utmost yield of the royal metal. I much fear the anticipations of our sanguine friends will be subject to terrible disappointment. This discovery of mercury can only be regarded as fortuitous and transitory. Though exceedingly rare in this country, it is not unique; but, singular to say, in the only instance with which I am acquainted, its occurrence was in a similar geological formation to that of its recent appearance—the New Red Sandstone. The City of York, founded upon an analogous stratum to that of Exeter, has at various times displayed a proneness to yielding quicksilver when probed to a certain depth, though I am not aware such an event is of recent date. I give you in full details the circumstances, as recorded in "Hargrove's History" of the first-named very ancient city, published in 1818:—

"It is very remarkable that in digging drains and cellars in several parts of the city the labourers have repeatedly found in the earth quantities of pure quicksilver. A particular instance of this occurred on excavating the cellars of a house at the corner of St. Saviour Gate, formerly occupied by Mr. Allen, a grocer; and near the same place, not many years ago, still more was found in digging a cellar or large drain. An investigation of the cause of this singular discovery (continues the learned antiquarian), though inconsistent with the purport of this work, is certainly worthy the attention of those who pursue with delight the pleasing labyrinths of natural philosophy."

Now, can we imagine mercury to have been used to such an extraordinary extent by the alchemists of old as that the globules should have percolated through the soil, and have aggregated in these particular localities, or, what appears to be equally extraordinary and improbable, that these deposits are the exudations of the metal indigenous to this particular rock? For my own part, I must acknowledge myself in a maze, and should feel under the deepest obligation to any of your numerous scientific readers who can throw a scintillation of light upon the subject. At the same time I should feel greatly obliged if any Exeter correspondent would inform me as to whether any further discoveries have been made of the existence of quicksilver since the appearance of your paragraph

upon the subject. My cabinet abounds in specimens of mercurial ores—thus, native sulphide, or cinnabar, and chloride—but not one exhibiting in its gangue or matrix any approach to either New or Red Sandstone. Nor do I believe either of these rocks productive of the metal. The true source of quicksilver I opine to be argillaceous schist and grit when intersected with granite and porphyry.

Laboratory and Assay Office, 25, Finsbury Place, E.C. W. WHITE.

LEAD ORE STANDARD.

SIR.—I should like to be informed, through the medium of the *Journal*, whether or not the standard is altered in the value of lead ore, or how the smelter makes his calculations for bidding. There must be a standard, and I have always been under the impression that it was 77 per cent., calculated in this manner:—Take 10 ozs. troy weight, of lead ore, melt it in an iron dish, pour it into a brass mould, if there is reason to suppose the lead is not clean out, run the slag again; if the produce is 7 ozs. 14 dwts., 77 per cent., it is the standard; if 7 ozs. 15 dwts., it is 77½ per cent., each pennyweight making a half per cent. Thus:—

Ozs. dwts.	Per cent.	Ozs. dwts.	Per cent.
7 8	74	7 15	77½
7 9	74½	7 16	78
7 10	75	7 17	78½
7 11	75½	7 18	79
7 12	76	7 19	79½
7 13	76½	8 0	80
7 14	77		

Formerly in making the calculation, knowing the standard, a mining agent could ascertain pretty nearly the value of the parcel of lead ore he had to sell. The standard being 7 ozs. 14 dwts. we add 2s. 6d. for every pennyweight above the standard, or deduct 2s. 6d. for every pennyweight below, down to 7 ozs. 8 dwts., or 74 per cent., then 3s. to be deducted for each pennyweight.

I sold a parcel of lead ore, eight months ago, at 14l. 6s. per ton, I assayed the sample fairly taken, and adopted the manner described; it was 7 ozs. 14 dwts., 77 per cent. I sold another parcel, the same quantity—50 tons each—a fortnight ago, I assayed a fair sample, the result the same—7 ozs. 14 dwts. I was asked by the secretary to the company what price might be expected; I naturally thought something approximate to the former, although I knew the demand was not quite so brisk, but I was certainly surprised that the highest bid out of six was 11l. 8s. per ton. Those who are similarly situated to myself know the amount of correspondence which this must create from the secretary:—"It must be badly dressed; send up a sample to the office! How have we such a wretched price? better to do this, better to do that." Yes, we did all this and that; and in a state of frenzy wrote to the purchasers, and their reply was—"Assay for lead 77 per cent." Hence my anxiety to know how this anomaly occurs.

Apologising for the length of my remarks, I trust the favour of your inserting this that many, as well as myself, may better know how to make our calculations. J. T.
June 9.

KALOSIC GAS.—No. VI.

APPLIED TO RAISING STEAM.

SIR.—Having shown in my last communication that the dilution of kalosic gas with nitrogen was in perfect keeping with the economy of nature, and that no evil result attended such dilution, but rather the benefit of rendering it less explosive than ordinary coal gas, I now proceed to touch upon certain practical points connected with its application to the raising of steam and other important uses.

There appears to be a general impression abroad that there is something very new in the nature of kalosic gas, which requires a careful scrutiny and examination before it can be admitted into our service; whereas the novelty lies in the adaptation and method of manufacture, and in the various details involved in the rendering it a fit and facile agent for purposes of universal use. Nay, it is a very old friend indeed, but only now assumes a new and distinguishing name in extending its sphere of action. We often see it burning with a blue light in our household fires, or welding at a white heat bars and masses of iron in our smithies and workshops. Its services are ubiquitous, nor is there a single pound of pig-iron smelted in the three kingdoms which is not due to its direct agency. But these uses and manifestations have been so far hap-hazard that they have been merely discovered as common among the general phenomena of combustion, and have not been actually designed by man to take place. Now, however, that these phenomena have been conquered, and they have been reduced to subjection, not only as regards the easy and measureless production of the gas and its cheap and rapid evolution, but its unequalled and absolute fitness for every purpose where heat and light are required, the public fail to recognise the value of the invention; they make all sorts of enquiries as to its character, question its aptitudes and economy, and then commonly dismiss it from further consideration with a sapient shake of the head. No wonder! The reason of all this doubt is the great want of technical education prevailing among the general body of the public—a want which disables them from distinguishing between physical truth and scheming falsehood—between sound science and designing quackery. Therefore, the pains and losses attendant upon mistaken investments, and the consequently prejudiced rejection of any truly sound opportunity which may afterwards present itself. The consequence is that the main body of the investing public trust themselves implicitly to the direction of great men (so esteemed), whose superior judgment and disinterestedness have been abundantly proved from the "windings-up, and Chancery records of the last few years."

The beauty of the process is that these very men who travel so smoothly and triumphantly along the every-day groove of present practice are, for the most part, incapable of judging of any sterling and wonder-working novelty which may be laid before them. They do not understand it, and, fearful of their reputation, they think it the safest way to be silent, or perhaps openly hostile. Those blind dependents upon other people's opinions are, therefore, frequently deprived, in addition to their losses, of many a good chance, which only reaches the Stock Exchange when the principal nuggets have been gathered. Why, almost the whole of those wonderful inventions which have completely changed the face of the earth, and which constitute the material of modern civilisation, as railways, telegraphs, locomotives, steam navigation, and the thousand other marvels of the century, all, or nearly all, have been accomplished by outsiders, conceived by outsiders, carried out by outsiders, and the capital in every instance has been found by keen-sighted men, who could see beyond their fellows, and who had made it a rule of life to use their own brains instead of other people's. Had it been otherwise, the results around us could never have been achieved. And some of these people are already beginning to use their brains upon my kalosic gas, and to ask the question why if the extraordinary facts I have stated, and the wonderful economy I have shown, are not true they are not at once overthrown, or at least disputed, by some competent person? Whereas the engineers and scientific men who have looked into the matter in doubt or utter disbelief have gone away perfectly convinced of the facts as I have here stated them in my various letters. I now pass to the question of raising steam by kalosic gas.

I have mainly spoken of the gas as a product from coke which might be circulated through pipes, and used as a most economical substitute for ordinary coal gas in the production of heat and light, costing only 2d. per 1000 cubic feet for heating purposes, and 6d. per 1000 cubic feet for lighting, the gas being equal to 30 candles. The heating power of the gas while thus in circulation is applicable to numerous purposes, such as cooking, manufactures, and household fires, and in each of these cases will realise a great economy over coal. But in large operations like the raising of steam or the smelting of metals, there must be no circulation at all, beyond what is absolutely indispensable to the conduct of the chemical changes required, and every unit of heat must as far as possible be made to contribute to the general effect, not only from the actual burning of the kalosic gas, but from the even more abundant heat produced in its manufacture. In generating steam, therefore, after the whole body of the coke employed as a charge is thoroughly and brightly red, from the top to the bottom of the furnace, column, or generator, the draught is directed downwards, and a pipe from the bottom, well cased in non-conducting matter, leads the red-hot gases to the boiler or into the fire-box, as the case may be, there to exalt their

already intense heat by still further combustion, either with or without the previous admixture of atmospheric air, and to surrender their caloric to the enclosed water. The heat arising from the generation of the gas is so great that, as I think I have before stated, the 2½-in. pipe which conveyed the manufactured gas from the top of the column at Aldershot was maintained at a bright-red heat for hours together over a total length of about 8 ft., though fully exposed to the cooling influence of the air. The circuit of the gas may be as long as desired, and, however small the tubes may be, it must pass through them from the pressure at the back, the pump consuming but a small fraction of the power. There is no objection to a boiler where the quantity of gas consumed is large, and the cooling effect of the tubes might possibly arrest combustion, but these effects are better provided for by wire-drawing the flame through a mass of fire-clay balls or bricks, or other substitute. Under no circumstances whatever can smoke be produced in burning kerosene gas, and when once the proper arrangements are made, nothing but downright neglect or intention can produce any waste of heat.

But these are not the only advantages. When steam is wanted the fire is alight and to perfection in one moment by simply turning a tap. It is reduced and again expanded with similar ease and swiftness, and when no longer required an instant suffices to put it all out. As the engine itself works the pump or exhauster which generates the gas, when the engine stops, whether sea-going, locomotive, or otherwise, the generation of gas stops also. When it again moves, so again does the generation of gas recommence and proceed. If the engine works slowly it is retarded, and if vigorously it replies with equal speed. In a word, the velocity of the one is a function of the other. No stowage is, therefore, required, and so fully and completely is the generator adapted to fulfil this relationship of chance requirement and broken continuity of service, that I have several times suddenly stopped the generator at Aldershot when in full work, and left it cut off from the atmosphere for certainly two, and I think on one occasion three, hours, and upon returning and putting the exhauster to work the gas came off at once as good, as swiftly, and as continuously as if it had never been stopped at all.

A great many questions have been asked me at various times as to the particular way in which the gas was burnt under my system to generate steam. I wish to make myself quite clear upon the subject. The enquiry naturally leads to a consideration of the character of flame, which in a popular sense is simply combustible gas or vapour in a state of intense combination with the oxygen of the atmosphere. Whether the flame be luminous or non-luminous depends upon the presence or absence of solid matter in it, and upon other considerations, which are more removed from the one distinct and radical question of abstract burning. In previous attempts to burn gas upon a large scale to generate steam it has been burnt as a huge blow-pipe, which is about as bad a method of accomplishing the object as could well be devised, for what is obviously required in raising steam is a full and ample heat capable of diffusion over a large surface, and not an intense heat concentrated upon a single point. Moreover, there are other great objections to such an arrangement, which would take some time and space to explain fully.

Now, if we look at a single gas flame, burning (say) 5 cubic feet an hour, and let us suppose that it is burning from an Argand burner, the central aperture or air cylinder thereof being stopped up, we shall see a long struggling conical flame as the result. If upon this we depress a sheet of fine wire gauze we shall at once see that the flame is hollow, and that the combustion is only going on upon the outer surface of the cone. Why? Because it is only there that the oxygen of the air can touch it. If we now remove the stopper from the central air passage of the burner the cone will disappear, the flame will shorten, and the burning mass will assume the form of a hollow cylinder, which, when the gauze is depressed upon it, as before, is seen to be also hollow in its own substance. The fact is that the oxygen of the air can now get at the inside of the flame as well as the outside, but is unable in either case to penetrate the shell of incandescent matter of which the flame is formed, and the better arrangements are for extending the supply of air the more complete is the combustion, and the more close and compact the steam-raising fire.

My method of effecting this object is to divide the gas from the generator among 600 or 800 plain gas jets, disposed in order and at equal distances over a divided parallelogram placed horizontally, whereby the heat rendered is enormous and uniformly diffused, and I modify the effect and curb the immense draft produced by passing the white-hot gases and products of combustion through a mass of fire-balls or other efficient substitute, so as to produce the general effect and appearance of a large white hot furnace. The evaporative arrangements may be those in common use, or the best that can be devised, and with reference to this it is right to bear in mind that when the complete combustion of the gas is once secured the tubes may be as small and as numerous as may be desired, for neither smoke nor dust can be produced with kerosene gas, and it is, therefore, impossible they can ever become choked.

In conclusion, I wish to refer to the fact that though I have spoken throughout of coke as being the material from which kerosene gas was produced, yet it is just as easily eliminated from any other carbonaceous matter under the provisions of my patent, and with even greater economy than I have already announced. Thus, it may be made direct from coal, anthracite, and peat, the secondary products where they occur being decomposed in the operation and going to swell the general bulk of the gas. After the surprise created by my original announcement that heating gas can be produced under my patent for 2½ per 1000 cubic feet, and lighting gas of 30-candle power for a total of 6½ per 1000, what will be said to the following, namely, slack is now selling in the North at the comparatively high price of 10s. per ton. From this very slack, at this very price, kerosene gas may now be made in any quantity at less than 1d. per 1000 cubic feet, and 30-candle lighting gas at a corresponding reduction, or a total of 5½ per 1000 cubic feet. The statement may excite increased astonishment, but it is true nevertheless.

ISHAM BAGGS.

THE SCIENCE OF INVESTMENTS.

SIR.—We look hopefully to the great investing public during the summer and autumn months. At no time since the rage for American mines, that ended in a collapse equally sudden and disastrous to all associated therewith, have favourable circumstances been so congenial, and the continued improvement in speculative investment been so marked and intensified, as during the spring of this year, in home mining enterprise; and, perhaps, at no epoch during the past decade—1865 to 1874—have the public had so favourable a moment for the choice of sound and bona fide undertakings as stood neglected at the close of last year. At that time coal and iron mines became a "drug" in the market, and the rage which had previously absorbed such general attention subsided. Doubtless the high prices of coal and iron justified to a great degree the fearless acceptance of both good and questionable companies that were launched; still, the strikes of miners, coupled with the keen discrimination of a cautious and intelligent public, detected the valuable from the worthless schemes, hence the pause in the wild career that pointed at one time to results equally abortive and disheartening with those that marked the progress of Californian and Nevada silver prospecting. There are these advantages, however, in coal and iron mining, that the money remained in the Mother Country, while the impetus given brought to the light of day numerous profitable fields of industry and wealth, and developed other and valuable mineral deposits. The first requisite of a good market is confidence—faith in personal opinion, which, in itself, is often the cause of success, and especially so when coupled with the desire to avail oneself of the opportunity which this faith discerns, and profit through events which gave rise to this powerful lever of confidence. It must be further remembered that confidence is wholly disconnected from recklessness; the first usually springs from merit, while the latter is ever allied with commercial inflation and feverish market excitement. The science of investment should be tempered and strengthened by sobriety, keen investigation, and ceaseless watchings. The pupil will never be carried away by inflation or dependency—the one is intemperate and the other inactive; both, however, are misleading only to the thoughtless and reckless. The disciple of the

science of investments takes advantage of ever remembering the motto of the late Sir Robert Peel—that to ensure success one must at all times buy in the cheapest and sell in the dearest of markets.

Neglected securities have for some months been looked up, and are in many cases steadily moving up to what is thought an approximate of their real worth. Of the new projects there are few which could be denounced by the strictest judge; and, as a rule, they are deserving of all the countenance they have received. Still, there are many neglected which patience must soon see advanced into the popular ranks, and it is to these undertakings that we would direct the attention of your readers, as from such spring the great prizes in mining pursuits. The Van, Tresavean, Buller, Carn Brea, Tincroft, Dolcoath, Devon Great Consols, and others, were equally neglected, yet they became the stars that enriched while they fascinated the public greed.

The advance in shares has been marked in many instances, and especially so in the following. The importations of tin from Australia had a very depressing effect on Cornish tin mines, still, notwithstanding the present prices approximate more closely to their actual value, it may prove interesting as well as instructive to many of your readers to glean at a glance the closing prices of the year 1873, coupled with those prevailing on June 10, 1874—viz:—

Dec. 1873.	June 10, 1874.	Dec. 1873.	June 10, 1874.
Dolcoath £ 45	£ 48, 50	Tankerville £ 15	£ 94, 9½
Carn Brea 150	65, 70	Lovell 10	2, 3
Cook's Kitchen 27	31, 30	Minera 30	20, 25
Tincroft 57	31, 33	Kitty 15	8, 9½
West Seton 45	30, 33	Trumpet 15	1, 2
East Pool 14	10, 11	West Chiverton 12	2, 2½
Providence 20	20, 25	Herodsfoot 17½	2½, 2½
South Caradon 100	65, 75	Bisset 60	25, 27½
Van 38	27, 30	Botallack 140	40, 50
Roman Gravel 19	16, 16½	North Levant 16	3
Great Laxey 15	11½, 12½	Margaret 8	1, 1½

32, Fleet-street, June 10.

R. TREDINNICK,

Dealer in Stocks and Shares.

JOINT-STOCK ENTERPRISES.

SIR.—The favourable state of the money market gives stability to our great and indispensable institutions. Joint-stock banks, discount, and others connected with the manufacture and sale of all our chief and staple products, both for home and foreign consumption. That the future is fraught with promise none can deny, for the press, a certain index of popular feeling and of healthy discernment, are for once united in breathing a spirit of encouragement; nay, of intensifying vitality in the future of enterprise, and thus inspire confidence in all home industrial undertakings. That banking, telegraphy, railways, shipbuilding, and other companies associated with manufacture and consumption of goods and articles of every day use, and identified with the requirements of the community, are in a prosperous state all must appreciate, and especially those practically connected with mining; for, next to agriculture, our mineral products contribute to the wealth, prosperity, industry, and social well-doing of the masses—no trade or business, manufacture or construction, employment or occupation, the arts and sciences, with commerce, locomotion, social enjoyment, amelioration or advancement, are disconnected with the production of coal, iron, copper, tin, and lead. Our iron roads, shipping which float on every sea, bridges that span our rivers, aqueducts that conduct our waters, warlike vessels, and the artillery that keeps and strengthens the power and growth of nations, all spring from the wealth found in chambers of the earth, which the industry, skill, and sinews of Englishmen bring to the surface. It is no light toil that produces over 120,000,000 tons of coal annually, or the vast bulk of ores that raise our supply of iron far above the yield of any other country in the known world. Copper in England is fast on the decline, and even where found is scarcely remunerative. Our miners have emigrated to Chili, the Cape, Australia, and from thence the bulk of the supply springs. Tin, again, is found by our countrymen in Australia, and there can be no question entertained that the quantity exported will increase, and in due course shut up the deep and expensive mines of Cornwall, but in respect to lead no extraordinary discoveries have been made though found in almost every country and clime under the sun. The supply is well kept up in this country, and the importations are large; still consumption keeps pace with supply, and the prices of that metal are likely to be fully maintained. We have some wonderful mines in Yorkshire, Durham, and Cumberland, and likewise in Denbighshire, Montgomeryshire, Carlisle, and Flintshire. Those in Cornwall are all but exhausted, and we must number with the prizes of the past the Tamars, West Chiverton, Trelawny, and Mary Ann; still there are several young yet progressive mines in the West that can now be selected with advantage, as the day is not distant when highly important results will be achieved. Several coal and iron companies pay large dividends—as, for instance, during the year 1873 Benhar divided 50 per cent.; Fife, 35½; Marbello Iron Ore, 15; Native Iron Ore, 12½; Thorp's Gawber Hall Collieries, 40 per cent.

There is no pursuit open for the investment of money that can exhibit such startling prizes, upon comparatively small outlays, as Cornish and Devon Mines, and in the opinion of practical authorities there are as many prizes left undeveloped as those already discovered, and which only require skill, application, and money to open and render equally remunerative. Commencing at Cape Cornwall, we have Levant and Botallack, which divided 170,000£ and 100,000£ on 400£ and 18,250£ respectively; St. Ives Consols, 90,000£ on 7520£; Carn Brea, 260,000£ on 15,000£; Dolcoath, 447,719£ on 46,194£; Cook's Kitchen, 300,000£ on 10,000£; East Croft, 78,950£ on 11,750£; East Rose, 287,360£ on 6400£; Fowey Consols, 209,313£ on 20,480£; North Roskear, 102,000£ on 7400£; Par Consols, 176,000£ on 7200£; South Caradon, 365,056£ on 6400£; Tresavean, 444,422£ on 3120£; United, 475,000£ on 16,000£; West Caradon, 75,000£ on 5120£; Alfred Consols, 100,000£; Great Alfred, 300,000£; Seton, West Seton, Tolguses, South Roskear, West North, East, and Wheel Basset, Buller, and others in Gwennap, 3,000,000£, on less than 200,000£ capital; while in Devonshire Wheal Friendship declared dividends of 304,064£ on 6400£, and the Devon Great Consols, 1,192,060£ on 1024 capital. Many other mines may be alluded to of world-wide repute, yet still unknown to many capitalists disconnected with active business, yet well worthy their attention as profitable investments—Great Laxey, Minera, Van, others in Yorkshire, Durham, Cardigan; and, lastly, not least, among the progressive mines, Zennor Consols, St. Agnes Consols, West Godolphin, and others, of which full particulars can be readily obtained. Turkish Five per Cents, at ruling quotations pay 12 per cent., in two half-yearly dividends, and as the coupons have now been regularly paid since 1860, a period of fifteen years, public confidence in the honour and integrity of the Government has become all but universal. This security is a good investment for gentlemen who possess credit with banking or finance companies, as, for instance, at 42½ per 100£, bond 5000£ would purchase 119 bonds, yielding 595£ annually; depositing the bonds as security for an advance of 4000£ at 5 per cent. would ensure a revenue of 197£ 10s. half-yearly on the remaining 1000£, or (say) 394 per cent. annually. This is important to gentlemen who can command money on loan.

32, Fleet-street, E.C., June 10.

R. TREDINNICK,
Consulting Mining Engineer.

TRETOIL AND CARRIGAN MINES.

SIR.—In an article which appeared in the Journal of Saturday last I notice a remark to the effect that these concerns have hitherto been conducted as private undertakings, though both registered under the Limited Liability Acts. The Tretoil Company did, I know, publish a prospectus, and it was through it that I acquired my shares in the company; but I have only on rare occasions since seen any public mention of it. I am, however, from the reports I have received as a shareholder, and from various other sources, and especially from a confidential friend, who has been a practical miner all his life, enabled to confirm what has been written as to the progress that has been made, and I know that no effort has been spared to procure the very best machinery and appliances to utilise the enormous mass of stuff that is in sight. The title "Tretoil" is justly applicable to this mine, not only for the reasons given, but for several others, which my time, in consequence of the pressure of business, will not allow me to go into now.

My principal reason for troubling you is to say that if mines of this class were brought prominently before the public, instead of the many worthless schemes that are only started to be wound up soon after, Cornish mining would bear a very different character to what it does. The want of success in mining enterprise does not always depend on the mine solely, but very often upon the economy with which it is worked; and when you get a rich mine, economically worked, under first-class management, and entirely free from water, shareholders in such undertakings have every reason to be well satisfied with their interest in them, as we all are who are connected with the Tretoil Mine. Still, while "Good wine needs no bush,"

I think that as the directors having once published a prospectus, and thus made the mine, as it were, public property, they should take the necessary steps to rest of your truly interesting intelligence.

Seeley, near Manchester, June 10.

SNOW BROOK LEAD MINE.

SIR.—Some years ago many of the readers of the Mining Journal were startled at the news of the discovery of lead ore at this mine by a Cornishman—Capt. Reynolds. Some 200 tons of lead ore had been extracted by a few men in a marvellous short space of time, but by degrees this deposit of ore ceased, or rather appeared to, and being an out-of-the-way place, no water troublesome, it was, after appearing a pit 10 to 12 fms., left to its own fate. A few years ago the Van started, and with it several other mines, some good, and others I trust will be, while to any one who would like to speculate I say go and visit Snow Brook, where can be seen that which thousands should have done before they let their money slip through their fingers, and blamed themselves because they did not either see for themselves or send some confidential practical man. A few gentlemen have again commenced to work the mine deeper, and the result is highly satisfactory. That a good mine is before them none will doubt. What is now in sight is good, but it is only a prelude to what must follow. Such masterly roles will not only pay in depth, and when such men are connected with Snow Brook begin a work they will and can carry it to perfection. The advantages now are very different to what they were when Capt. Reynolds worked it. It was then the mine; now there are mines thickly dotted from Gossan to the Van. And his is situated three miles or so to the west of Van. A new water-wheel is to be erected at once to master the underground water, and good roads will soon be completed. These advantages, together with an abundant supply of water-power to work the necessary machinery to dress the ores, will soon be made manifest to those who have embarked in this valuable mineral district.

Abertawe, June 9.

CORRESPONDENT.

BAMPFYLDE MINING COMPANY.

SIR.—Observing the letter in last week's Journal signed "X," I can only say that I was desirous of purchasing shares in the above company, but from the conduct of Messrs. Ender and Co., who preferred that I should pay a visit to the mines I bought an interest in it, I accordingly did so, and had the pleasure of meeting a very intelligent agent in the manager, who gave me every facility and afforded me every opportunity of going over the property. I was surprised at the number of openings on the iron lodes, and the large heaps of rich iron ore on the surface at each of the various openings. The iron, as a whole, is the richest I have ever seen. The lodes are most prolific, and I see no reason why 1000 tons of iron cannot be returned weekly. These lodes appear to be inexhaustible, besides which the copper ores and manganese could be doubled. The returns of ore must, I should think, be considerable, and the dividends large and continued, with bonuses added. I endorse the letter signed "X," and believe that the Bampfylde, as a whole, is one of the richest mines in England, as it will be one of the best dividend paying ones.

34, Herbert-street, New North-road, June 5.

J. RICHARDS.

[For remainder of Original Correspondence, see to-day's Journal.]

Meetings of Public Companies.

UNITED BITUMINOUS COLLIERIES COMPANY.

An extraordinary general meeting of shareholders was held at the London Tavern, on Tuesday, for the purpose of considering, and if approved passing, the following resolutions, viz:—

That the capital of the company be increased to 35,000£, by the creation and issue of 10,000 additional shares of 1£ each. That the said 10,000 additional shares shall in the first instance be offered to the members of the company now on the register at par, and any shares not so applied for on or before July 1 next shall be disposed of in such manner as the directors may deem expedient. That the directors be authorised and empowered to borrow any sum or sums not exceeding 10,000£, for the purposes of the company, as provided by the 33rd, 34th, and 35th sections of the Articles of Association.

Mr. PALMER in the chair.

Mr. D. M. DEWAR (the secretary) read the notice convening the meeting.

The report of the directors in recommending the adoption of these resolutions, assured the shareholders that additional capital is indispensably necessary for the proper development and completion of the works. It has all along been the one weak point in their management of the business of this company that sufficient capital has never been at their disposal, and when absolutely necessary to obtain it they have been forced to make use of the services of sharebrokers. They now earnestly and urgently appeal to the shareholders to increase their investment in the company by subscribing for more shares, so as to provide sufficient capital to complete the works and pay off the vendor.

It is undeniable that the expenditure has considerably exceeded the original estimates of the vendor and consulting engineer of the company, for which the directors cannot, however, be held responsible; but the value of the property has been greatly increased by the erection of machinery and buildings, and by the opening up of the Weig Colliery in such a substantial manner as to avoid large and continuous outlay in the future for repairs. The buildings and machinery for the manufacture of fire bricks have also been considerable, for which no provision was made in the original estimates. Whilst, however, the expenditure has exceeded the first calculation, the directors confidently believe that their early expectations as to the probable profits to be derived will be fully realised if the required funds are supplied, as the quantity and quality of coal and fire-brick are beyond question. It is, therefore, for the shareholders, now to decide whether they will strengthen the hands of the directors by providing at once ample capital for the due development of this valuable property, or allow it to fester and deteriorate for want of funds. The directors who issue this circular have given unflinching attention to the interests of the company, but are quite willing and prepared to retire should the shareholders be of opinion that there are other members of their body capable of conducting the affairs of the undertaking to a more successful issue. Should the shareholders subscribe the required capital the profits already earned will be forthwith distributed.

The CHAIRMAN said the subject introduced in the notice convening the meeting had been under consideration of the board for some time past, having felt that the capital was insufficient to develop the property. Each member of the board had the fullest confidence in the value of the property, and felt perfectly assured it would prove everything that had been represented of it, and that the only one thing necessary was the additional means wherewith to develop its resources. At the last meeting they had a source of revenue from the Pollydome pit, but that had been shut against them since January by the influx of water. To clear this pit, to develop the Weig Colliery, and to extend the brick-making—each of which was a distinct and important source of revenue—further means were necessary. It was upon this ground, looking to the great interests of the company, and knowing the value of the property, that the directors had been induced to call this meeting. At one time, although it was known the question of the increase of capital was necessary, it had been thought its consideration might have been deferred until the yearly meeting, but in consequence of having been unable to place the number of unallotted shares expected it had become absolutely necessary to ask for further capital. He then moved the first resolution.—Mr. STEMMERS seconded the proposition.

Mr. JOHNSTONE said there had been some misconception as to the time for the lodgment of proxies, by which the representatives of capital to the amount of some 5000£ could not take effect. Under those circumstances he begged to move an amendment that this meeting be adjourned for a fortnight.—Mr. SMITH seconded the amendment.

The CHAIRMAN said it was of course the desire of the board to meet the wishes of the shareholders in every possible way, but one great object was to save time, and whatever was done at this meeting would have to be confirmed at a subsequent one. He would ask whether those who desired an adjournment could explain the views of those whose proxies were invalid?

Mr. MERCHANT said those proxies represented some of the largest shareholders, who desired an adjournment. He could not express the views entertained by those gentlemen unless he were allowed to vote on those proxies.

The SECRETARY said any five shareholders could demand a poll. If the proxies were invalid the owners of those proxies could vote at the subsequent confirmatory meeting.

Mr. FUTCHER suggested in the event of an adjournment being agreed to that a statement of accounts should be issued in the meantime.

Mr. MERCHANT said he wished it to be understood that he had great confidence in the property, and felt perfectly satisfied that it would, with proper management, pay well.

The CHAIRMAN said there could be no doubt upon that point, but the directors were cramped for want of capital, and this would not have been so immediately necessary had not one source of revenue been stopped for four months.

Mr. MERCHANT asked if the Chairman were inviting the meeting to oppose the views of those represented by proxy?—The CHAIRMAN: Most certainly not. His only object was to save time. The proxies had been placed in the hands of a shareholder who legally could not vote, but the directors were quite willing to waive that objection altogether.

The amendment was then put and lost. The motion for the increase of the capital was then put, when—

The CHAIRMAN, in reply to a question, stated that the capital already subscribed amounted to 22,624£, and that there were 2300 shares to place; about 4000£ was yet due to the vendor. To open out the Weig Colliery to a greater extent would be a work of time.

A SHAREHOLDER asked if the board thought they would get the unpaid shares subscribed for at par?—The CHAIRMAN said there was every reason to hope so. A dividend had been already earned, but they were not in funds, in consequence of the stoppage of the works at Pollydome. The CHAIRMAN submitted a statement of the present financial position of the company, from which it appeared that the assets exceeded the liabilities by 1500£. As to the unpaid capital, he considered, looking at the value of the property, and the progress now being made, the unpaid shares should realise more than par value; the bricks alone should return a handsome profit.

Mr. SMITH said a dividend of 10 per cent. was expected in March, and had that been paid there would be no difficulty in raising any amount of capital. The property he believed to be a good one.

The CHAIRMAN said the actual money was not in hand but in stock. A dividend of 10 per cent. had been actually earned, but the stoppage at Pollydome had deprived them of a portion of the money.

Mr. FUTCHER said that although the meeting had voted against an adjournment

Mr. SNELL: My proposition is that the directors shall take nothing until the shareholders receive a dividend. He (Mr. Snell) was proceeding to refer to some matter in connection with the first history of the company, when—

The CHAIRMAN asked what was the origin and object of bygone? The great object was to get the mine better footing in the future. (Cheers.) They elected their first elect a director, and then Mr. Snell could bring forward the other subjects to which he wished to refer, and he would not adjourn the meeting until Mr. Snell had had an opportunity of doing so.

Mr. HAMOND said there were important points to be taken up and considered, and they must be taken up by all the shareholders, and not one set of shareholders against the other. There was an important set of men to fight, and important and delicate questions involved, and the shareholders must work together or they would run the risk of losing every shilling.

Mr. SNELL said he also wished to submit a resolution relative to the desirability of abolishing the present position from the mine; and, on the understanding that he should have an opportunity of bringing all these matters forward after the election of a director, he proposed that Mr. Alexander McDougall, the holder of 300 shares, be appointed a director.—Mr. BURNARD seconded the resolution.

Mr. WOOD said that the party with whom he acted, whether beaten or not, was quite prepared to accept the verdict of the meeting. He went on to refer to the pamphlet which had been issued by Mr. McDougall, and read and commented in strong terms upon the language used in some of the paragraphs, in which reference was made to the vendors, and how they were the present directors, and asked how it was that at least, he had in his pamphlet made use of strong expressions; in fact, if Mr. McDougall were elected there were none of the present directors who could remain on the board except Mr. Burnard. As long as he and his party could do so they would prevent the election of Mr. McDougall, because the whole of the pamphlet foreshadowed the state of things which was likely to exist if he were elected to the board, and no gentleman could sit at the board with him.

A SHAREHOLDER: There is no gentleman who would have written such a thing as Mr. Wood says. As far as I know, the issue was plain and broad—they could not accept Mr. McDougall's election. Mr. McDougall had no secret from Mr. McDougall before the last meeting, but it was an improper thing that a gentleman who could write such a pamphlet should be elected. (Cheers.)

Mr. McDougall, who had several times interrupted the last speaker, again attempted to speak, when Mr. T. G. TAYLOR said: Gentleman, I appeal to your sense of order. He is not to speak on every occasion.

Mr. WOOD said he would conclude by moving that Mr. C. W. C. Hutton, an ex-sheriff of the City of London, the original holder of 200 shares, and a gentleman of position and the highest respectability, be elected a director of the company in place of Mr. McDougall.

Mr. Genl. McCRA seconded the resolution. He said that they could not possibly put Mr. McDougall on the board, and added that he could not understand how any one calling himself a gentleman and a man of honour could write such a letter or pamphlet.

Mr. McDougall said he maintained every word he said in the pamphlet. (Oh, oh.) He asked Mr. Anderson, the late chairman of the company (who was sitting amongst the shareholders), whether, on the occasion of his going to America, he did not send over a telegram to sell some shares? He then proceeded to read a letter which he had addressed to General Schenck containing certain questions which he thought that gentleman would answer, and said he had never received any answer to that letter. (A laugh.)

Mr. HAMOND reminded Mr. McDougall that the question before the meeting was the election of a director, and any letter such as was referred to could not possibly bear on the question.

Mr. McDougall went on to say that he intended to proceed against the vendors and the original directors of the company.

Mr. GREENOUGH, who said he was an American citizen, and the owner of 200 shares, protested against the attempt which Mr. McDougall had made to associate with General Schenck, and he said that he was not having much success in his acquaintance with General Schenck, and therefore made this protest on his own responsibility, but he could not possibly see what relevancy the mention of General Schenck's name had to the question under consideration. (Hear, hear.) He contended that private affairs should not be made part of a public meeting.

The CHAIRMAN agreed that the name of General Schenck should not have been imported into the question at this moment, as it had no bearing whatever upon the question at issue, though at the same time he considered it most unfortunate that an ambassador, accredited to this court, should have had his name mixed up with a mining speculation.

Mr. Genl. McCRA said he had read Mr. McDougall's pamphlet with surprise. If Mr. McDougall had nominated an original shareholder to the board he would have said nothing, but Mr. McDougall had only purchased his shares in April, this year, and therefore could not have been a loser like the original shareholders, and yet Mr. McDougall talked about dishonest motives, and a scandalous prospectus issued two years ago.

Mr. McDougall here interrupted, upon which—

Mr. T. G. TAYLOR exclaimed: You are not proving yourself fit to be a director. Mr. Genl. McCRA said that Mr. McDougall was no sufferer from the original prospectus, yet he had left it open to the vendors, and thus caused them to suffer. (A laugh.) He (the speaker) believed there was some motive at the bottom of it, which he did not pretend to fathom. (Hear, hear.) He considered that what Mr. McDougall had written was most unutterable twaddle. Then Mr. McDougall said he did not want the shareholders' money to prosecute his case; this was very wise on his part, because if he did he would not get it. If Mr. McDougall came upon the board, he would, like a Malay, "run amuck" against the vendors and others, and strike out everyone, right and left, ignorant of the circumstances which governed the case, and waste the feeble resources of the company, and ruin the Emma Mine; but it must be done with the greatest caution, and he would do the worst one that every shilling which remained should be his own most carefully in explorations, in order to give the company a chance to revive its prosperity. He believed that the mine had not been put in thorough working order, and they could not find ore if it was not there.—A SHAREHOLDER: It is there.

Mr. HAMOND, M.P., said he endorsed what the Chairman said relative to the position which General Schenck held with respect to this company, and said that he did not doubt that gentleman's name being connected with the company induced many shareholders to take shares in it; at the same time, from the honourable name which General Schenck held in his own country he was sure he was above doing anything of a dishonourable or dishonest character, or unbecoming the character of a gentleman. (Cheers.) Referring to some of the personalities of one or two of the previous speakers, he expressed a hope that it would not go forth to America that the shareholders were a set of squabblers; and he reminded them that, although they might have lost their money, yet they had something to save better still, and that was their position and character as English gentlemen. (Cheers.) He had taken the greatest possible trouble to go into the matter, and he felt they had a solid and good claim against certain parties who negotiated with the company's sale the Emma Mine; but it must be done with the greatest caution, and he would do the worst one that every shilling which remained should be his own most carefully in explorations, in order to give the company a chance to revive its prosperity. He believed that the mine had not been put in thorough working order, and they could not find ore if it was not there.—A SHAREHOLDER: It is there.

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(the speaker) whether he could continue to do what he hoped might be of service to the company. The directors would have a very difficult task to perform if Mr. McDougall was to be their colleague instead of Mr. Hutton. (Hear, hear.) He next went on to say he had always maintained that the company had a claim under the contract against the parties from whom they had the Emma Mine.

Mr. CARR said he had great faith in the mine; he had heard on good authority that an attempt had been made to drown the shareholders out of the mine, but he believed that, if properly worked, it would still be a good mine.

A show of hands was taken, when 58 were held up in favour of Mr. Hutton, and only 3 in favour of Mr. McDougall.

The CHAIRMAN said that Mr. Hutton was duly elected by a show of hands—an announcement which was received with loud cheers.

Mr. SNELL demanded a poll, stating that he represented 230 shareholders.

Maj.-Gen. McCRAE: I represent 296, and I ask you not to demand a poll, and put the company to that expense.

Mr. SNELL persisted in his demand for a poll, which the CHAIRMAN fixed to take place that day fortnight, at the Cannon-street Hotel, at 12 o'clock. He also stated that no proxies would be received after 2 o'clock on the previous Saturday. He also informed the meeting that after the last meeting, when the shares had a slight rise, certain gentlemen, who held 4445 shares had sold 1556 of them.

Mr. SNELL: How many did they buy?—The CHAIRMAN: None; these are the gentlemen who want to come in and control this company. (Loud laughter.)

Mr. McDougall asked the directors whether they were aware that, next week, Mr. Lindell was going to present a petition to wind up the company?

Mr. SNELL then proposed that the number of the directors be increased to seven.

Mr. SNELL seconded the motion.

The motion was lost, 18 hands being held up in favour of 2, and 42 against it.

Mr. SNELL then moved that the resolution relative to the directors' remuneration be rescinded, and that the future remuneration should be fixed from time to time at the ordinary general meetings of the company.

The CHAIRMAN ruled that such a resolution was inadmissible, as notice of such a special resolution was required.

Mr. HAMOND, referring to the holding of half-yearly meetings, said there could be no objection to such meetings being held, and that the directors would be happy to fall in with the suggestion. With respect to monthly reports, if very favourable or unfavourable information were received from the mine it should be published.

In answer to a question whether the board intended to take any action against the vendors,

Mr. HAMOND said the shareholders had better leave the matter in the hands of the board, who would call the shareholders together six months earlier if they had any news of a gratifying character on that head to report to the shareholders. Of course if Mr. McDougall liked to take independent action in the matter he could do so. He believed the company had a good solid claim against the vendors—the person who sold the property. He was not referring to the promoters, but to the vendors. If the directors could make an arrangement to prosecute a claim against the vendors they would do so.

A SHAREHOLDER asked if that was an official announcement on behalf of the board?—Mr. HAMOND: It is my announcement. (A laugh.)

In answer to a shareholder, who complained that the shareholders had been kept out of the mine,

The CHAIRMAN said that, at the request of any bona fide shareholder, who wished an expert to visit the mine, an order for admission would be given, and he added that Mr. Attwood had acted perfectly right in refusing admission to persons who had not the authority of the directors to enter the mine.

A SHAREHOLDER asked whether Mr. Attwood had joined Capt. Forbes and Capt. Lucas in the purchase of the Chancel Mine, and expressed his opinion that if he had it was not a proper thing to do whilst he was in the service of this company.

Several SHAREHOLDERS said that Mr. Attwood ought not to be called upon to answer such a question, and one gentleman remarked that if Mr. Attwood had money surely he had a right to invest it as he liked.

Mr. ATTWOOD said he should certainly refuse to answer any such a question. Referring to the condition of the mine, he said it had been reported upon by Mr. Blackwell, Mr. Clarence King, and Prof. Murray, all of whom had reported very much as he had done.

A SHAREHOLDER said he had received information from America that the water had been let in the mine intentionally by Mr. Attwood himself, and asked Mr. Attwood whether such was the case. Mr. ATTWOOD indignantly denied the truth of the accusation, and asked for the name of the writer of the letter, in order that he might take proceedings against him.

The shareholder refused to give it, and a scene of some confusion ensued, several gentlemen expressing an opinion that it was a most unwarrantable proceeding to make such a charge against Mr. Attwood, giving the name of the writer of the letter.

A SHAREHOLDER: Was Hawkins the writer of the letter?—The SHAREHOLDER declined to answer, but said that if Mr. Attwood attended at his office he would show him the letter.

Mr. ATTWOOD said he would do so, with the view of taking immediate proceedings in a court of law.

Mr. ATTWOOD, in answer to a further question, said that at the time the water got in the mine there was no ore at the bottom of the mine or shaft.

A SHAREHOLDER: What news has been received from the mine since we last met?

The CHAIRMAN said that a letter had that very morning been received from the mine, which he would read:—

Little Cottonwood Canyon, May 18.—Having time now to look the matter up, I find that I was wrong in reporting the output for the week ending April 25th at 8,190 tons, and also wrong in my dates. I wrote in great haste in order to get the letter off in time. I can now say with certainty, that as the result of our sorting operation, the output for the week ending April 25, 1874, should read as follows:—Output is concerned, 24,700 tons "M" ore assaying (as before given) 7,194 tons ordinary "M" ore assaying 34½ lead, and 7,990 oz. = 94.24 silver; instead of 24,700 ton "M" ore, &c.; 7,194 tons ordinary ore assaying 21 lead and 43.74 = \$56.56 silver. I think this will be understood. I will add, while writing, that almost all the ore of last week's output came from the old works above Nos. 1 and 2. We have now no ore whatever between Nos. 3 and 4, and none below 4. No improvement in the shaft.—HANNALD WILLIAMS.

It would be seen from the letter that the ore was being taken from the old workings, and up to the time it was written no new ore had been discovered.

A SHAREHOLDER: Is there any ore in the shaft?—Mr. ATTWOOD: No, there is not.

A SHAREHOLDER: How much do you consider to sell per week now?

Mr. ATTWOOD said that they were not smelting to sell more than 20 tons, which was worth about 100 ozs. a ton, but that would not last long, as they were pickings from the old workings. It would be some time before the concentrators got to work. They were raising sufficient to pay expenses, and would do that all the summer by the concentrators.

Some reference was made to the question which was raised at the last meeting relative to the bill for 2000, taken for transmission to this country, and about the goodness of which some little doubt was expressed at the time; and the CHAIRMAN stated that since the last meeting the bill had been met, and therefore there was no further need to discuss the question. He went on to say that the board had the utmost confidence in Mr. Attwood, and if they travelled the world over he doubted whether they would get a man who suited their interests better, or who worked more faithfully for the company.

A SHAREHOLDER asked whether any communication had been received from Mr. Park of late?—The CHAIRMAN said none whatever. (A laugh.)

A vote of thanks was then passed to the Chairman, and the meeting adjourned.

NEW ZEALAND KAPANGA GOLD MINING COMPANY.

A general meeting of shareholders was held at the offices, Austin-friars, on Monday.—Mr. T. F. GRAY in the chair.

Mr. W. J. LAYINGTON (the secretary) read the notice convening the meeting.

The report of the directors (which has already appeared in the Journal) was taken as read.

The CHAIRMAN said he had really nothing to add to the information communicated in the report. The mail had not arrived, owing to an accident to the steamer, by which it had been delayed some ten days; but whatever additional information the letters contained would be immediately communicated to the shareholders. He proposed that the report and balance-sheet be received and adopted.—Mr. T. F. HENLEY seconded the proposition.

Mr. DOWNES enquired if the engine referred to in the second paragraph in the report was a pumping-engine?—The CHAIRMAN said it was a stamping engine; there was already on the mine a pumping and winding engine.

Mr. DOWNES asked how long it was reckoned it would take to reach the additional depth of 26 fathoms?—The CHAIRMAN said it was expected the 320 would be reached by the middle of August, but it depended very much upon the character of the ground through which they had to sink. They calculated upon being able to sink from 30 to 40 ft. in four weeks, and they reckoned upon completing the cross-cut in ten or twelve weeks more.

A SHAREHOLDER asked if they had enough money to complete these works?—The CHAIRMAN said they expected when the whole of the shares were taken up there would be sufficient for all their purposes.

The SECRETARY explained that the items in the balance-sheet included all the work done in New Zealand, and it was expected the future expenses would be considerably lessened.

Mr. L. WRAY, in reply to a question, stated that the directors had not taken any fees, the 1600*l.* in the balance-sheet being a mere matter of account.—Mr. DOWNES was perfectly aware that by the Articles of Association the directors were legally entitled to the remuneration set forth in the balance-sheet, but submitted they were rather high for a period of what might be called preparation for the future.

Mr. L. WRAY said, as he had already mentioned, the directors had not taken any fees; if the enterprise should prove successful he did not suppose shareholders would object to pay the stipulated remuneration; if otherwise, he did not expect the directors would ask for any remuneration.

A SHAREHOLDER asked if the remaining 415 shares had been taken up?—The CHAIRMAN: Not yet; but he thought it not improbable they would be.

A SHAREHOLDER would like to know if, in the event of their not being taken up, whether the works now in progress could be completed?—Mr. L. WRAY thought they might safely assume they would be taken up. By means of a section of the mine, he pointed out the various points of operation. It had been thought there was a probability of cutting a lode previous to that which would be intersected by the cross-cut, and the opinion was strengthened by the great influx of water; but, although the ground was highly mineralised, it did not turn out to be a lode; still, however, they were strongly in hopes that the lode would be cut long before it was reached by the cross-cut. In justice to their manager, he thought he might say everything had been done that could be reasonably expected from any man; the work had been carried on remarkably well, and very full reports were furnished, which was a great desideratum. The Kapanga Mine was looked upon in New Zealand as the best mine there. The Caledonia, upon the same range of lodes, had hitherto been the leading property in the Thames Valley, having yielded upwards of 600,000*l.* in dividends, but now was, unfortunately, filled with water. But now that the Kapanga had secured the adjoining claim, that was universally looked upon as the leading mine, there was sufficient ground to keep them at work for a large number of years. It was important to note, also, that this additional ground had been fully proved, and when the late company left off the lode was yielding 3½ ozs. of gold per ton. With a little patience such results would be realised as could not fail to be satisfactory to all concerned.

The report and balance-sheet were received and adopted. The directors were re-elected, and the auditor was re-appointed. A vote of thanks to the Chairman and directors closed the proceedings.

THE WEDGWOOD COAL AND IRON COMPANY.

The first annual general meeting of shareholders was held at the North Staffordshire Railway Hotel, Stoke-on-Trent. The chair was occupied by Mr. ALEXANDER BURNES ANDERSON, the Chairman of the company, who, upon moving the adoption of the report, said the document was a very full one. The directors had not exaggerated anything, and there was nothing disguised. When the works were taken over by the company they were chiefly ironstone works, and there were few workings in the coal. The stock of ironstone now on hand might to some shareholders seem large; but in this respect the company was far better off than some of its neighbours. The stock of stone was taken over at the low price of 12*s.* 6*d.*

The average price of that sold was 18*s.* 8*d.*, and the lowest price taken has been 16*s.* a ton. When trade was brisk, as it was last year, the company was unable, unfortunately, to send off stone for want of wagons, which at that time, there being such a demand for them, it was extremely difficult to obtain. Now, out of a couple of hundred of furnaces in South Staffordshire only about 40 are in blast, consequently there were just now but few customers for ironstone. At present the directors confined their attention exclusively to coal. He would maintain that the company, during its short existence, had done remarkably well, and he was confident in this view by the opinion of their neighbours in the trade with whom he had spoken. They had raised 60,000 tons of minerals during the first year of their working, and this was a young undeveloped colliery, and they had realised on this, or the greater portion of it, after deducting the colliery expenses only, a profit of 12,000*l.* This was, he considered, good business for the first year. As to the present position, capabilities, and output of the concern, the first day of the present fortnight they had raised 320 tons of coal, and in a few weeks, as they had had now got to the end of some of their drifts, and were coming back getting coal, they would be raising 2500 tons of coal a week. He had much satisfaction in being able to announce that since issuing their report they had got down to another seam of coal—the Little Row or Four-foot, as it was called—on the Brindley Ford portion of the estate, which they were then working. This was one of the best seams of coals of the district. The directors had full confidence in this property; its value was really immense. They had, in fact, three collieries, two of which were ironstone mines as well. The thanks of the directors were due to the indefatigable and painstaking secretary, Mr. Lambert, whose services had been of the utmost value to the board. Their thanks were also due to the managers at the collieries, Mr. Baddeley and Mr. Clews, whose activity, skill, and unceasing attention, night and day (for they had scarcely ever stopped working night and day since they began), were beyond praise.

Six gentlemen, resident in Liverpool and the neighbourhood, were elected directors for the ensuing year; and Messrs. Harmond, Banner, and Son, of Liverpool, were appointed auditors.

Votes of thanks were passed to the late directors and to the Chairman.

After the meeting all the shareholders paid a visit to the collieries, and were much pleased with what they saw there; and on their return to the hotel the retiring and new directors and shareholders sat down to an excellent dinner, served by Mr. Patser. Great unanimity of feeling prevailed, and confidence was expressed in the success of the undertaking.

IMPERIAL BRAZILIAN COLLIERIES.

A half-yearly general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Wednesday, Lord BINGHAM in the chair.

Mr. D. L. DUVAL (the secretary), read the notice convening the meeting.

The report of the directors stated that of the 3000 15 per cent. preference shares recently authorised to be issued, 2214 (representing 11,070*l.*) have been subscribed for, leaving only 786 to be allotted. Sales of coal have been made during the past half-year to the extent of 933*l.* 3*s.*; and according to advices from Mr. Johnson, dated March 12, orders were then in hand for the supply of coal to the gasworks both in Port Alegre and Rio Grande. The directors are arranging to have periodical returns of the output and sales of coal, which will at all times be open for inspection by shareholders at the office of the company. Since the last general meeting the directors have appointed Mr. William Tweedie, jun., to succeed Mr. Johnson as the company's manager in Brazil, and Mr. Tweedie left England on the 10th of April last; and, with the view of having a more energetic, skilful, and economical working of the colliery, the directors have also engaged an efficient, practical, and well-recommended Durham miner as underwriter, who will start for Brazil by the Boyne on the 9th instant. The board trust that these appointments will be approved by the shareholders, as they believe that the present arrangements will produce satisfactory results, and they hope at the next annual general meeting to be able to announce that marked progress has been made under the new management. A provisional contract has been arranged with Mr. George Bower for the supply of a tug and four 60-ton barges for the sum of 7500*l.*, and an offer of other floating stock has been under consideration. But, in consequence of representations lately made to them, the directors deem it advisable to defer final orders in this matter until receipt of advice from Mr. Tweedie, who has been directed specially to enquire and report thereon.

The CHAIRMAN said the report was so full that very little was left for him to add. Since March last the reports from Mr. Johnson, who had ceased to be manager, had been more than meagre, for they were next to nil; but Mr. Tweedie would probably have arrived about May 25 to take charge of the works, so that they must hope that from this time a new order of things will be established, and that in a couple of months hence they would hear he had begun to do a good business. With these few remarks, he would move that the report be received and adopted.

Mr. BOWER seconded the proposition.

Dr. GOODSELL reviewed at some length the history of the company from its commencement. He drew attention to the statement made at the meeting in February, 1872, by Mr. Pemberton, who was in the chair, that if the Articles of Association were amended so that the board would join the board who would bring in a large amount of capital. The result was that Messrs. Plant and Ross were elected directors in the following March. The first cheque drawn was on account of the purchase, and for 7000*l.*; this was drawn in favour of Mr. Ross. It was clear that Mr. Ross was a vendor's nominee, and had no right to sit on the board. He then quoted from the prospectus, and impugned the correctness of several of its statements, and urged that as the present Chairman and Mr. Ross were the last of the original directors they should be called upon to retire. He then moved as an amendment, "That with the view of diminishing the cost of management, and Lord Bingham and Mr. Ross having resigned the office of directors, it be expressed as the wish of the meeting that henceforth the directors be reduced to the number of five, and that the reduced number, until the shareholders in general meeting shall otherwise determine."

Mr. BARCLAY, M.P., seconded the amendment. He thought that the whole of the original directors being responsible for the present position of the company should retire. He was much pleased with the report which Mr. Laity had supplied, but it plainly showed the utter incompetency of the original board.

A SHAREHOLDER thought there were few companies which cast greater blame upon the original promoters than this.

A SHAREHOLDER said it was clear that if the original directors were cognisant of the incorrectness in the statements put forth in the prospectus, he had no hesitation in saying nothing more flagrant could be conceived; and if not cognisant, it was still more disgraceful, and in either case they must take the consequences. If the original directors did not retire he should be compelled to propose the appointment of a committee of investigation.

Mr. COLLYER said he was one of the largest original shareholders, and he need hardly say he was as anxious as anyone that the affairs of the company should be properly managed, but he failed to see what possible advantage could result from re-discussing the circumstances in connection with the original formation of the company.

The CHAIRMAN could easily understand the shareholders feeling acutely for having been so long without a dividend, and therefore, was not surprised that hard words should be said against himself and the original directors. He did not plead guilty to any mismanagement or misstatement, and denied there was anything misleading in the prospectus. It had been discussed at meeting after meeting, and there had been committees of investigation almost after each meeting, and several members of the present board had been members of those committees. As to the value of the property, Mr. Laity had confirmed everything that had been said of it, although he found fault with several things that had been done, but the whole question now was whether they possessed a good coal property. They contended it was, although probably depth would be required to reach coal suitable for ocean steamers; it was, however, perfectly good for gas purposes. Personally, he did not wish to sit upon the board one minute after it was the wish of the shareholders he should retire.

Mr. J. R. PIER said that Dr. Goodsell held 28 proxies, representing 3000 shares, the holders of which supported the amendment now before the meeting.

Mr. ROSS said he was not a nominee of either of the vendors, but a trustee of three of them, and in that capacity the cheque alluded to had been made payable to him. It was passed to his account at the Bank of England, and several cheques were passed against it next day. He was not a director at the time the company was launched, but, finding that further capital was required, after repeated solicitations he consented to accept a seat at the board, when himself and friends subscribed towards the capital.

After some further discussion, Lord Bingham and Mr. Ross signified their intention of resigning their seats at the board, upon which Lord Bingham left the chair.

Mr. BOWER was then unanimously voted to the chair, when the amendment was put and carried.

Mr. BOWER said that when he entered the room he did not think he should have been called upon to occupy the position of Chairman. On behalf of the directors who had resigned, both had been most attentive, especially Lord Bingham. Whether he possessed sufficient practical knowledge to act as the director of a colliery company he was not prepared to say, but with regard to his desire to benefit the company by attention to the duties of his office, no man could be more devoted to a company; and he could speak similarly of Mr. Ross, who, as far as his business capacities went, had placed them unreservedly at the service of the board. He (the Chairman) had paid his guineas for his shares, and was a debenture as well as a shareholder. When he accepted a seat on the board he avowed his object was a selfish one. He was interested to the extent of 100,000*l.* in gasworks in Brazil, and, therefore, was exceptionally interested in obtaining coal there—that was his sole inducement. He also happened to be the Chairman of a steam shipping company recently formed to run vessels from this country to Rio Grande—hence he was very much interested in getting cheap coal in Brazil. He happened to come upon this board when the mischief had been done—he found there was a spot a manager of the works which he was carrying out there who perfectly understood collieries. This gentleman had from time to time written to him (the Chairman), giving him every possible information, and that information had been anything but encouraging. From those communications it appeared

that the Engineer and manager out there was totally inefficient. But he had now submitted himself to the future. They had nothing in hand, and, as he could now submit a dividend, it was difficult to make them believe, when he had been so much disappointed, that there were hopes of a successful future. He could say, unquestionably, that the coal was there, but whether of the quality originally expected he was not prepared to say. Even the seam in which they were now engaged in working, although it would answer as compared with the Newcastle gas purposes and for steamboats, yet it would not do for ocean steamers; but there were other seams within reasonable depth, and what the board proposed to do would be, as soon as Mr. Tweedie had taken an actual survey of the position of things, and his report had been received, to turn attention to the seams which lay below the present one. In the meantime, the instructions which he (Mr. Tweedie) had received were to develop the seam which they were at the present time working. They were now on a new pit, and Mr. Laity reports that there was a 7 ft. seam of very good coal. In that case, if it be of a moderate quality, surely it could be brought down with good profit to a port where coal averaged 6*s.* per ton, and surely a very moderate output would soon give dividends. He did not mean to say they were going to have a dividend directly—it was easier to begin to make to obtain results than have to go back and retrieve one's blunders. If blunders had been made it had been done in ignorance, and not wilfully. His idea was this: there should be a managing director, a perfectly qualified man, capable of conducting business properly, and the directors to act as a sort of committee. If one business was conducted properly he thought there were reasonable hopes that a coal would be very considerable, but much would depend upon the quality of the coal. He thought the coal was there, and that there was sufficient money to enable him to bring that coal to market, it had yet to be determined whether it was of the quality to enable them to find a market. His (the Chairman's) manager was of that opinion on the spot; he was a practical engineer, and well conversant with collieries. He would act as consulting engineer to Mr. Tweedie, so that but a short time would elapse before they might look for a very different state of things. This he promised—so long as he was connected with the company the shareholders should always know the worst. As to the tug and barges, a special resolution should be passed enabling the directors to contract with him (the Chairman). As the circumstances of the company were not very flourishing, he made a proposition to get the company out of its difficulties. The proposition was still before the board, and he was still ready to carry it out, but Mr. Scott had stated that there was no necessity for taking this step, as tugs and barges could be obtained out there, either on hire, or on consideration of the matter had been deferred until more information had been received from Mr. Tweedie. Looking at all the circumstances connected with the company, and its present position, he trusted that in future they would meet with more cheerful faces. (Hear, hear.)

The report and accounts were received and adopted.

A resolution was unanimously passed that, having heard the explanations as to the application of the additional capital, this meeting approves the expenditure, and authorises any mode of application the directors may think beneficial.

A vote of thanks to the Chairman and directors closed the proceedings.

THE MELINDUR VALLEY LEAD MINING COMPANY.

A large and influential section of the shareholders met together on the mine last week at the invitation of the managers, for the purpose of inspecting the property, and satisfying themselves as to the character of the recent important discoveries in the new adit level.

The party were received by Mr. John Kitto, M.E., and conducted by him over all the surface works, and then into every part of the mine underground. The massive character of the machinery in operation, and the richness of the ore coming up from the mine appeared to cause the visitors present the highest satisfaction, specimens of the lead ore being secured by all present.

Upon the party returning to Aberystwith it was voted that Mr. HALFORD take the chair. He said it had been his privilege for the last 12 or 14 years to have been intimately connected with mining in the Principality of Wales, but he did not think he had been connected with a mine that had presented such excellent and encouraging prospects as the one they had visited that day. He had been connected with several that had been very successful, and paid good dividends, but he repeated there was not one he could recall which in its early stages had shown such remarkable prospects as the Melindur Valley Mine; in fact, the much questioned if either Cwm Eridia or Goginan at similar depths could show anything half so good. They had all seen as much of it that day as he had, and as he did not want to occupy their time inasmuch as there were so many shareholders present, he should be glad to have some expression of opinion from those who have seen the mine and could judge of its value as well as he could.

Capt. WILSON CLARKE said he could speak of what he had seen that day with great pleasure. It would be presumption on his part to give his individual opinion when so many gentlemen were present far more capable of judging of the qualities of the mine, but notwithstanding that, and though he did not claim to have the large practical knowledge of a mining expert, he thought that what he had seen that day did not require any judgment of his mine, for anyone could see what the prospects of the mine were, as it was so self-evident to men of ordinary intelligence. He could see in whatever direction he went the quantity of valuable ore, and the extraordinary facility with which it could be got out, dressed, and sold. There was one point he could mention—the first-rate condition in which they found everything at the mine, and he must say that the mine manager had shown much care in the way in which he had expended the capital of the company. Everything was in perfect order, and it was a great satisfaction to him as a director to see that the money entrusted to his care had been so well expended. All he could say was, as long as he was director of the company he should be proud of the position, inasmuch as it was a pleasure to have to do with a mine which seemed so satisfactory in all its future prospects. As long as he remained a director he would spare no efforts to make the mine a great success, and he was sure he could say the same on the part of his colleagues, who were most willing to do their utmost to conduct the business that devolved upon them as directors for the benefit of the shareholders, in fact, as the Cornishman would say, for "One and All."

Mr. BOWMAN said, that the meeting of that day had afforded him the greatest pleasure. As for anything he could say about the mine they had visited he did not speak of it, because he had come more as a learner than as being in possession of any practical knowledge of the Melindur Valley Mine. But for the last 35 years he had been a good deal connected with the mountain lead mines, and if he could form any judgment of this mine by comparison with others containing silver he should say the Melindur Valley Mine had a great preference. (Hear, hear.) In the first place, he was always frightened of water, and in his district they were almost drowned. In this mine they had very little water to contend with, and what they had got enabled them to work their machinery without the expense of buying coal. This mine was more valuable than others he was acquainted with on account of the percentage of silver in the ore; so far as he had examined lead ore from silver-bearing mines he judged that in this mine there was a good deal of silver. That was the result of his observations. He had examined samples of lead ore from various mines, and from which he had seen that day, as well as on a previous occasion, he was convinced that the Melindur Valley ore contained a great deal of silver. When he visited it in February last, which he did in a casual manner, it was almost lock-bound, but within a period of four months it had been started in complete working condition. (Hear, hear.) He had been in the bottom level and it was drained, and their pumping machinery would take five times the water they had to pump, and, in all probability, would take more than ever came through that formation, which was very close, and he did not think the mine would have very much water in it. The mine seemed to be to Mr. excellent management, from Capt. Clarke, the chairman of the company, to Mr. Kitto, who was the actual overlooker of the works, and it was a pity that no stone would be left untaken to make it a success. He was convinced, particularly from what he had observed that day, that the Melindur Valley Mine has an excellent future before it.

The CHAIRMAN asked Mr. Bowman what was his valuation of the lode per fm.? Mr. BOWMAN said it was difficult to say at present, as the lode was altering so rapidly in character, becoming so much richer, but for every inch wide of the lode it would be worth about 14 cwt. per fathom. If they could tell him how many inches of lead there were they would have so many times 14 cwt. per fathom; if the lead held good all through the lode as he saw it in one place that day it would turn out 4 tons per fathom; it was certain that was a moderate calculation for one part of the lode near the engine-shaft.

Mr. KITTO said that Mr. Bowman was quite within the mark in placing the amount of lead at 14 cwt. per fathom with an inch width of lead, the ordinary calculation was that a rib of ore 1 in. wide would yield 20 cwt. per fathom.

A SHAREHOLDER asked whether that might be regarded as an average of the value of the lode?

Mr. KITTO replied in some places it was more, in others less. In some places it was half as wide as the table. He supposed 3 in. would be a fair calculation of the average for the length of the lode. He believed the part Mr. (Mr. Kitto) had no doubt the lode was worth at least 4 tons per fathom. The stoep he said was a very excellent one as far as it had turned out, and better than was anticipated, and it improved as they went on. If it continued as it was he for one should be exceedingly well pleased. As the stoep was that day he had no hesitation in saying that they would pay the cost of the mine from that one stoep alone. The inside ore was not quite so good, but was, nevertheless, an excellent stoep. He could not pretend to say what it would be at the 12, but if they had ground of the stoep at the 12 and 24, and he saw nothing to prevent it: there was not a shadow of doubt that they would have at that shallow depth a good dividend-paying mine. Mr. Kitto further remarked that the locality of the mine should not be lost sight of. This mine was very well situated with regard to other productive and profitable mines. On three sides they were surrounded by mines which had produced immense quantities of ore, and had returned immense profits to the owners. The only mine, which was an exception was the west, and there they had the West Goginan Mine, which as far as they could see was likely to vie with its neighbours on the other side. If they got out of the bearing rock of the district, or as it is never got ore in right zone, they might as well shut up the mine, for they would not be bearing rock paying quantities, but that was not the case when they got into the bearing rock of the district. In the Melindur Valley they had the right sort of rock. The principal supply of water for working the machinery was brought to them by several miles of water-courses, and hundreds of acres of reservoirs constructed by other people at an outlay of many thousands of pounds, the whole being available to this company without cost or charge, not only did the water which the other mine made use of come down to them, but that also which was pumped from the mine which they could not use, so that they had as far as he could see an inexhaustible supply of water in quantity all the year round.

Mr. ATTWOOD said he believed the water which was brought by the other companies, and used by the Melindur Valley Company, had cost them from 10,000*l.* to 15,000*l.* Mr. KITTO, being asked what he had to say for or against the pleasure of meeting the present members of the board, others said he had the pleasure of meeting several times, and he hoped this would not be the last occasion on which he should meet them all. With regard to the Melindur Valley Mine itself, he did not know he could add to what he had already stated about it, and it was not necessary to repeat what he had said. Whether he deserved as manager of the company all that had been said about him by the shareholders present he hoped the future would prove. If he undertook the management of a concern he went into it heart

THE GOLD DEPOSITS OF NOVA SCOTIA—No. III.

While the investigations of Mr. O. C. MARSH, conducted entirely at his own expense, awakened the interest of United States scientists and capitalists, his opinion as Professor of Paleontology at Yale College naturally having great weight, it must not be overlooked that the existence of gold in Nova Scotia was almost indicated by many local names—such as *Gold River*, *Gold Lake*, *Bras d'Or*, *Cap d'Or*, *Jeddore* (a corruption of *Jet d'Or*); and that Sir CHARLES LYELL, in his "Notes on the Geology of North America," in 1842, and Dr. J. W. DAWSON in the first edition of his "Acadian Geology," in 1855, suggested its probable occurrence.

Many instances of its discovery, and its subsequent rejection as worthless stuff, or the suppression of the discovery for fear of unsettling people's minds, are well recollected by old inhabitants. One of the best authenticated cases of its existence being detected by a geological observer is that at Gold River, where an officer of Fusiliers, when salmon fishing in the spring of 1811, pointed out rocks to his guide which he declared to be gold bearing, and which actual search, after a lapse of more than 20 years, proved to be so.

Prof. How, of King's College, in his valuable standard work "The Mineralogy of Nova Scotia," also states that gold had been washed in the River Avon, N.S., in the early part of this century, and that its existence was well known to the Rev. Canon Gray, grandfather of the much-esteemed Mr. B. G. Gray, barrister, of Halifax City.

Next to the instance of scientific observation recorded at Gold River there was another decided finding by Capt. (then Lieutenant) CHAMPAGNE L'ESTRANGE, R.A., who while hunting moose with some Indians at the head of Tangier River, picked up a piece of auriferous quartz, which he brought to and exhibited in Halifax. The discovery, however, which gave rise to a general search and systematic exploration is really due to Mr. JOHN GERHARD PULSIFER, a small farmer, who, from conversation with miners who had been in California and Australia, came to the conclusion that it would be worth while prospecting for gold quartz in his native country. For a long time his researches were unsuccessful, but one day, returning from a prospecting tour, he accidentally detected a piece of quartz containing gold as he was stooping to drink in a brook not far from the scene of Capt. L'Estrange's discovery. After further search, Mr. PULSIFER found more gold, and took some specimens to Halifax, in the vain hope of being rewarded, or at least granted a right to mine on some portion of the Crown lands free of expense; but the poor fellow met with no encouragement, and was, in fact, told by the then leader of the Government to "go home, and mend his old shoes."

The evidences of a general distribution of the precious metal throughout the metamorphic region of the Province became, however, so accumulative, that the local authorities appointed Mr. JOHN CAMPBELL to examine the eastern and Mr. HENRY POOLE, F.G.S., father of the present Provincial Inspector of Mines, to visit the western districts; and although these missions were undertaken at a very unfavourable season or the year, when there were frequent snowfalls, their results completely upset the theory of the Provincial Secretary, who had publicly declared that there was not gold enough in the country from which to make a lady's trundle. Attention having thus once been officially directed to the subject discoveries, for the most part accidental, followed upon each other, and led to the opening up of the so-called proclaimed districts—Tangier, the Ovens, Sherbrooke, Wine Harbour, Isaac's Harbour, Waverley, Lawrence town, Oldham, Unalake, and Carleton, the distinguishing features and history of which will be treated on hereafter.

The unfortunate war prevailing in the United States at the period of these discoveries had so much depressed business that even the official recognition of their genuineness, and the testimony of Prof. B. SILLIMAN, who also visited the country, and published a very favourable opinion of the extent and undoubted permanency of its gold deposits, failed to stimulate enterprise, the provincials having no money to spare for mining experiments, and being too apathetic to know this new source of domestic wealth properly known abroad.

Mr. J. ARTHUR PHILLIPS, a celebrated authority on gold mining, however, visited the Province at this early stage, and confirmed the testimony of others in regard to the character and abundance of its quartz veins. A company was formed in England with a nominal capital of 55,000*l.* to work the mines, but although the localities were well chosen, and in other hands afterwards became profitable, the money subscribed was squandered by the purchase of useless machinery here, and incompetent management out there, so that its career was a very short and disastrous one.

The next official examination of the Nova Scotia gold fields was undertaken by Dr. T. SPERRY HUNT, F.R.S., assisted by the late Mr. AUGUSTE MICHEL in 1867, by order of the Ottawa Government, and the last, in 1869, by Mr. A. R. C. SELWYN, successor to Sir Wm. E. LOGAN, as director of the Geological Survey of Canada. The favourable report of the last-named authority has been reviewed at length in the Journal, and too much importance cannot be attached to it, when considered that it emanates from one who is entirely disinterested, and who has had a better experience than almost any other living geologist, through his long experience in Victoria, Australia, for furnishing a true estimate of the value of a gold mining region.

THE VIEILLE MONTAGNE MINING COMPANY.

The past financial year of this company was one of some difficulty to the undertaking. The advance in the price of combustibles, labour, and materials very materially increased the cost price of the products made available for consumption by the company—products which were not sold at prices yielding an adequate compensation for the sacrifices which the company had to sustain. Notwithstanding, however, these adverse circumstances and conditions, the exercise resulted in a very respectable commercial profit, in consequence of the sale of zinc and zinc white manufactured with the company's own minerals. The realisation took place upon satisfactory terms last year of a small part of the company's stock of minerals, while a profitable sale was also effected of the production of galena, coal, and coke achieved by the undertaking. The general result of the working operations of 1873 was that the company was enabled to distribute among its shareholders a dividend equal to that of 1872, while some addition was also made to the reserve fund out of the profits of last year. The high prices of rolled zinc and zinc white, which were maintained all through 1873, slackened, to some little extent, the sale of the company's metal during the last three months of the year. Thus, instead of 45,458 tons sold in 1872, the company only disposed in 1873 of 39,539 tons. On the other hand, the company's production was somewhat smaller in 1873 than in 1872. The company's Valentin-Cocq and Baldaz-Laloré collieries necessarily profited last year from the extraordinarily high price which prevailed for coal, and yielded altogether exceptional results—results which are not very likely to be repeated in 1874 and subsequent years. These high prices enabled the company to maintain in operation the southern portion of the Valentin-Cocq concession; at the same time the fact must be recognised that this colliery must prove of short duration unless the company decides to make explorations in the northern portion of it, so as to commence working there.

The directors are pursuing in such of the metallic mines as are situated on neutral territory and on the Belgian portion of the concessions works of exploration, which hitherto have not presented results worthy of being noticed. The company must now face the probability of a relatively early exhaustion of these bearings. The directors have accordingly been considering for some years past the best means of making good these mines, which have long been the principal source of the company's profits. It was with this feeling and impression that sundry mines in Sweden and on the Rhine have been acquired and developed; that a new concession has been acquired from the French Government in Algeria; and, finally, that combinations have been formed for the working in association with other parties of important mines in Sardinia and Spain. Thus far the production of the company's Swedish mines has been limited to the requirements of the company's fabrication; but as these mines have

now all desirable appliances, they might easily be made to furnish a more considerable contingent of minerals. The result of the preparatory works undertaken is all the more favourable and fortunate, since the blends ores obtained from this source furnish a very pure metal, which may replace for certain special purposes the zinc of Moresnet. The directors also notice as a favourable circumstance the presence of lead, which presents itself more and more in the company's Swedish mines, and which from this period seems likely to contribute to the company's profits.

The company's Rhine mines, which have also been brought into a good condition, are one of the finest properties of the Vieille-Montagne. Their galena has brought the company this year an important contingent of profit. It may be observed for the rest that these bearings, although very limited in their annual production, promise to present fruitful and profitable results in future years. The mines which have been conceded to the company in Algeria have been examined at various periods by the engineers of the undertaking, and they evidently present a considerable extraction area; unfortunately, however, the strength of the minerals obtained from these mines is so comparatively feeble that their working can only be lucrative after the establishment of railway communication. A line, which will pass at a no great distance from the mines, has been conceded by the Government to a French company; the preliminary surveys have been made, and the Vieille-Montagne directors are now hopefully anticipating a commencement of working operations. During the last two years the Vieille-Montagne has made great efforts, and expended a certain amount of capital, in order to bring certain mines in Sardinia, in which it has a participative interest, into good working order. Mechanical construction workshops have, for instance, been established in connection with the most important bearings. The company is now arriving at the close of its additional works and expenditure, and it is about to enter upon the period when the production of the mines may be expected to prove a compensation for the efforts put forth for their development, and when substantial profits may accordingly be looked for from them.

CAMBRIDGE UNIVERSITY, AND THE TECHNICAL SCHOOLS AT KING'S COLLEGE, LONDON.

The warmest congratulations of all interested in extending the facilities for the acquisition of sound technical instruction as part of that higher course of study which can alone command an honourable position in the universities of Oxford, Cambridge, Dublin, or Durham, may be offered both to the Vice-Chancellor and Senate of Cambridge University, and to the Principal and Academic Staff of King's College, London, upon the satisfactory progress which has been made toward securing the affiliation of the latter institution to the University, upon conditions which promise to prove alike advantageous to both societies. From the report of the year's progress just presented to the Court of Governors of King's College, it is gratifying to find the College is in a highly prosperous position—the efficiency of the teaching staff is thoroughly well maintained; the increase of students and pupils, which has been noticed in every annual report for some time past, continues; and the institution is in a stronger financial position, although it is without endowment, and has to compete with endowed foundations and institutions subsidised by the Government—and, therefore, not labouring under any disadvantages which could either at Oxford or Cambridge be construed to make its affiliation, so far as the status of the college is concerned, a matter of questionable expediency.

It will be recollected that not long since the Principal (the Rev. Canon Barry, D.D.), and certain members of the Academic Staff, officially visited Oxford and Cambridge, for the purpose of suggesting an affiliation of the College to those Universities, so that Associates of the College may, under certain conditions, be allowed to obtain degrees after a shorter residence at the University, the members of the University being allowed, if they think fit, to avail themselves of the advantages of the technical schools of King's College. The Council, approving the general idea, had requested the Principal and Academic Staff to ascertain, by conference with some leading members of both Universities, whether there was any reasonable chance of the entertainment of such a proposal. The deputation was decidedly successful, and on Tuesday the matter was brought formally before the governing body of the University of Cambridge, by the Vice-Chancellor publishing the proposals offered as the basis for a negotiation. It is suggested that Associates of King's College, and such other students as shall have attended the regular course of lectures at King's College, and gained special distinction in the examinations, shall, on presenting satisfactory certificates from the Principal, be allowed to enter as second year students, provided that they pass such examinations as the University may require. Further, that undergraduates of Cambridge shall be allowed, on obtaining special permission, to spend their last year at one of the technical schools at King's College, receiving all the advantages of matriculated students, and shall take their degrees at the university in regular course.

That the affiliation of King's College would involve the recognition of the principle of the affiliation of local colleges generally, provided they proved themselves equal to the standard fixed by the University, cannot be doubted, but the difficulties of carrying out the project so as to prove beneficial to the University are not, we think, insuperable. That the graduates of universities where residence is an essential condition of graduation form an altogether superior class of men to those whose academical position has been obtained through Brougham's "graduating machine," or similar institutions, cannot be denied, and none can better appreciate this fact than those who have had the melancholy pleasure of attending reunions of graduates who have met each other at the examination tables only, and to whom the pleasures and advantages of associating with those resident at a university, and learning something of university life such as it exists at Oxford and Cambridge are unknown; but, by the suggestion now under consideration, the benefits of the true university system will be extended to a larger proportion of the community, whilst the vigour of the universities will be maintained through their becoming at once popular and more directly in accordance with the views upon educational matters now entertained.

The object of the movement is to give the status of a university man to deserving students, who may be unable to find the time or incur the expense of the full period of residence in Cambridge or Oxford, but the Executive of King's College would by no means wish that the standard of knowledge or study necessary for a degree should be lowered. By any such alteration the object would be entirely defeated. But merely studying in a college practically under the control of the University, although not in the same town or city with it, during one year of the undergraduate course, would, we venture to think, be of benefit to the University itself, inasmuch as it would afford to Oxford and Cambridge students intending to devote themselves in after life to industrial or commercial pursuits greater opportunity for studying whilst still at college in those localities where there exist the greatest facilities for acquiring the branches of knowledge most likely to be useful to them. Thus, the Oxford and Cambridge medical students could avail themselves of one year's experience in the admittedly superior medical schools of London, whilst the student connected with manufactures or engineering pursuits could, assuming the affiliation of local colleges generally in the same way, choose a centre specially adapted to their requirements.

The students who would avail themselves of the arrangement would be comparatively few, but they would be precisely those students best calculated to reflect credit upon the college or university with which they are associated—students with a definite object in view, and who are willing to work with diligence to attain it. At Trinity College, Dublin, the graduates of which are at least equal for sound practical knowledge to any in the kingdom, terms may be kept by examination instead of residence, yet no inconvenience arises from the regulation. The number of graduates who have so kept their terms is not large, but none of them have reflected more discredit upon the College than have students whose studies have been pursued entirely within the College walls. It would be the same were the affiliation of King's College, London, and local colleges of equal status, to the Universities of Oxford and Cambridge

carried out; only the highest class of student would take the university degree, and many who under the existing system would never visit Oxford or Cambridge would become students there would they avail themselves of the one year's outside study. The position only be considered to induce the conviction that the College is entitled to rank with any on the Cam or Isis, and we quite believe that the statement made, "that the recognition by the Universities of the principle involved in the project would be of great advantage to the higher education of the country," is in every way justified.

RAILWAY GROUPING.

The question of the transfer of Railways to the State appears to have almost faded out of public sight for a time; but a paper by Mr. B. HAUGHTON, C.E., on the advantages likely to be derived from what Mr. HAUGHTON styles "railway grouping" presents serious food for reflection. Although it may be fairly doubted whether the advantages attending the transfer of railways to the State would not be counterbalanced by the disadvantages resulting from a dull State monopoly, still Mr. HAUGHTON's railway grouping would probably have the effect of securing greater economy of management and greater unity of action, while, at the same time, the principle of competition in the public interest would not be wholly abandoned. The advocates of State ownership and control of railways could also scarcely object to Mr. HAUGHTON's proposals, as their adoption would probably pave the way for the eventual transfer of the various lines to the State, with the provision of such further safeguards in the interest of the public as further and more extended experience may devise.

Mr. HAUGHTON's suggestion is that four—and only four—great networks should be formed in Great Britain—that is in England and Scotland. These four groups, he suggests, should be termed the London and North-Western, the Great Western, the Great Northern, and the Midland groups respectively. While Mr. HAUGHTON is a bold railway reformer—at any rate, a bold would-be railway reformer—he is at the same time a sensible one, as he does not overlook the current tendencies and features of the railway world. Thus the London and North-Western, the Great Western, the Great Northern, and the Midland having gradually established a very high credit, capital naturally groups itself around them; and whether Mr. HAUGHTON's ideas are carried out or not, they will probably continue to grow in importance by amalgamations. Amalgamations proceed, however, very slowly, especially when it is proposed to unite one monster undertaking to another; and what he appears to aim at is an acceleration, if possible, of the fusion process. The London and North-Western group, the formation of which he suggested, would, if developed as he proposes, be of very great extent and importance. It would embrace, *inter alia*, the Lancashire and Yorkshire, the Cambrian, the Caledonian, the Great North of Scotland, the North Staffordshire, and the London, Brighton, and South Coast. In the Great Western Mr. HAUGHTON would comprise the London and South-Western and the South-Eastern; and as regards the Great Northern, he would annex to that important concern the Great Eastern, the North-Eastern, the North British, and the Highland, of which, however, he would allow the Midland to have a joint ownership. As regards the Midland, which is the last of Mr. HAUGHTON's groups, he would transfer to it the Manchester, Sheffield, and Lincolnshire, the Glasgow and South-Western, the Highland (to be held jointly with the Great Northern), the London, Chatham, and Dover, and the Bristol and Exeter. The first group would have four stations in London, the second five, the third three, and the fourth three, so that the metropolitan public, at any rate, would be well accommodated. The magnitude of the networks which Mr. HAUGHTON has created on paper may be inferred from the fact that the principal one, the London and North-Western, would embrace 4480 miles of line, and earn 350,000*l.* per week.

The question, however, is how does Mr. HAUGHTON propose to carry out his views? It is easy, of course, to create paper networks, just as the late Emperor NICHOLAS, of Russia, drew a direct paper line between St. Petersburg and Moscow. But how does Mr. HAUGHTON suppose that Parliament, which shows itself so sluggish and so chilling in the matter even of comparatively small amalgamations, could be induced all at once to sanction monster fusions such as those which he proposes? The moment, for instance, that the amalgamation of the Lancashire and Yorkshire with the London and North-Western was suggested, or sought for, half the public bodies and all the hungry lawyers of Lancashire and Yorkshire would be up in arms; they would raise the loudest possible clamour and offer the largest possible opposition, so that the amalgamation would probably fall through. Does Mr. HAUGHTON suppose that he can soothe with a stroke of his pen the local public bodies of the empire, and satiate or awe with a wave of his hand all its hungry lawyers? We fear that it is not in his power to attain such a result. Still we incline to think that amalgamations must, in the nature of things, be gradually carried still further. The natural tendency of the railway world is for great companies to absorb their smaller neighbours, and the number of small companies must steadily decline. But we do not think that the present Parliament, or the next either, will sanction the creation of Mr. HAUGHTON's four monster networks.

ROCK-BORING MACHINERY.—Messrs. HASELTINE, LAKE, and Co., patent agents, Southampton-buildings (or James Ashbury McKean, of Paris), have patented some improvements in those machines whereby the drilling or boring of the rocks and other hard substances. This invention relates to improvements in those machines whereby the drilling or boring of the rocks and other hard substances is effected by the action of the drill or perforating implement carried and operated by a reciprocating piston, which is driven more or less rapidly to and fro within a cylinder by the force of steam, compressed air, or other elastic fluid admitted alternately to opposite ends of the said cylinder by a distributing valve; and the said invention is designed to diminish the cost of the construction, to reduce the weight, and increase the strength and durability of these machines, and to render them generally more efficient and convenient than heretofore for all purposes for which they may be employed. The said invention relates, first, to various improvements in the drilling, boring, or perforating mechanism; and, secondly, to novel stands or frames for the said machines.

FUEL.—Mr. W. A. LITTLE, of the Grove, Hammersmith, engineer, has obtained a patent for an improved process in effecting the consolidation of the dust or small fragments of coal or coke into masses suitable for fuel. The feature of novelty consists in the consolidation of small coal or coke, with or without an admixture of powdered pitch or bitumen, by means of a plastic or creamy "slip" of clay, together with a starchy paste, or hydraulic cement in powder, or both together. These materials have been used separately for this purpose heretofore, but the novelty consists in their combination, by means of which greater consolidating efficacy is realised at a lower cost. The process is applicable to coke made from peat.

BLOWN-OUT SHOTS.—Mr. R. S. NORRIS, of Kenyon, Manchester, has patented an improved arrangement and apparatus for preventing blow-out shots in mines and quarries. This invention consists in the employment of a special metal rod, having on it two loose discs of the same diameter as the required drill, and at each end a head welded, screwed, or otherwise fastened to it; but in one of the discs there is a recess or slot for allowing the passage of a fuse; but the discs may be fastened and thereby form heads and discs. The fuse, which is formed of paper or other suitable material in the usual way, is placed on the discs, the rod being in the centre; and after the fuse is inserted through the recess or slot, the cartridge case is charged with gunpowder, gun cotton, or other explosive material. When the cartridge on the discs is placed in the cavity prepared for it in the mine or quarry, and tamped in the usual manner, and the explosive material ignited, it will be found that the whole explosive force is exerted on the discs and on the mass surrounding the cartridge, and as the action of the disc at each end of the rod is equal, there will be no tendency to blow out the cartridge, or any part thereof, being blown into the mine or quarry, thereby preventing blown-out shots and their attendant danger of explosion.

GAS-ENGINES.—Messrs. HASELTINE, LAKE, and Co., patent agents, Southampton-buildings (or T. B. Fogarty, of Warren, Massachusetts), have obtained a patent for improvements in gas-engines, and in apparatus for producing gaseous mixtures to be used in the same. The improvements relate to an inexpensive form of gas-engine, or prime mover, driven by means of a special gas-producing apparatus. The gas or vapour with air; and to means and apparatus for mixing such combustible gas or vapour with air; and to means and apparatus for producing hydro-carbon vapour to be used for such purposes. They consist in—1. A motive power engine in which the explosive force of the gases is applied through the intervention of a water piston. 2. Making the area of the gas chamber of the engine smaller than the area of the piston. 3. A special valve for the passage of water and gas. 4. The combination with a motive power gas-engine of a special gas-producing apparatus. 5. A gas-producing apparatus provided with a governor, while one of which is constantly open and operated and regulated by a governor, while the other is intermittently opened and closed. 6. A double-seated valve for the outlet of the gas produced. 7. A valve for regulating the supply of air open continuously, and operated by a governor.

FOREIGN MINING AND METALLURGY.

Chilian copper in bars, delivered at Havre, has made 70*l.* 4*s.* per ton at Paris; ditto, ordinary descriptions, 77*l.* 4*s.* per ton; ditto, in ingots, 84*l.* per ton; and Corocoro minerals (pure copper), 81*l.* per ton. At Havre, Chilian in bars has made 77*l.* to 80*l.* 16*s.* per ton. At Rotterdam, it has been quoted at 50 *fls.* to 52 *fls.*; and Russian at 51 *fls.*. At the sale of tin just held by the Dutch Society of Commerce, at Rotterdam, the average price realised was 57*l.* 4*s.*, but tin has since been moving upwards until it has realised 60 *fls.* in purchases are now made by speculators, but consumers are expected to follow their example. The present disposable stock of Banca is relatively small; transactions have taken place at from 57 *fls.* to 58 *fls.*. Billiton is comparatively cheap, but prices have risen from 55 *fls.* to 57 *fls.*, and a slight further advance seems probable, as the price of Banca reacts upon that of Billiton. Banca tin, delivered at Havre or Paris, has made 100*l.*; Straits, delivered at Havre or Paris, 103*l.*; and English, delivered at Havre or Rouen, 103*l.* per ton. At Rotterdam, Banca has been quoted at 59 *fls.* to 60 *fls.*, and Billiton at 58 *fls.*. At Havre, French lead, delivered at Paris, has made 21*l.* 4*s.*; German, 21*l.* 4*s.*; and German of various marks, 12*l.* 12*s.*; Silesian zinc, delivered at Havre, has brought 23*l.* 4*s.* per ton at Paris; other good marks, delivered at Havre, 22*l.* 16*s.* per ton; and ditto, delivered at Paris, 22*l.* 16*s.* per ton.

The past week has been rather a less interesting one for the Belgian iron trade than for the Belgian coal trade. There would, unfortunately, be nothing very striking to report had not a rather important order for girders been obtained for Russia. Luxembourg pig has been offered at somewhat firmer rates—that is, not below 2*l.* 16*s.* per ton. Belgian refining pig, hard iron, cannot, however, be carried beyond 3*l.* 10*s.* per ton. Prices have not been better supported, upon the whole; they fluctuate at from 8*l.* to 8*l.* 8*s.* per ton for merchants' iron, 8*l.* 16*s.* for girders, and 9*l.* 4*s.* per ton for rails, and no change appears probable for some little time. These prices would not be disadvantageous did not many establishments want work, and were many forces not hampered with considerable stocks of pig purchased at high rates; for those working up pig bought at current prices the cost price of the iron produced is almost as favourable as in good years. The Brussels Metal Bourse has not yet been productive of much business, but its influence begins to be felt, and the trade augurs favourable results from the establishment of this institution, which may be regarded as of English importation. M. Mason, one of the managers of the Renaissance Rolling Mills, at Louvroil, has patented a new system of puddling and re-heating furnaces, from which he expects to realise a saving of 30 to 40 per cent. of coal.

The French iron trade appears to be tolerably contented with the turn which affairs have taken. Thus orders have come to hand with more regularity, if not with more abundance; and, under all the circumstances, less uneasiness is felt as to the future. The most striking characteristic of the present state of affairs is the good tone of rail quotations, as compared with the prices current for merchants' iron, and prices for rails are for the present more remunerative than those of iron. As the demand for rails is not at all too active at present, the difference indicated in prices can only arise from the relatively precarious condition of small industries and of the building trade. The demand for rails, on the contrary, is free from very excessive fluctuations, as the requirements of consumption can scarcely fall below a certain limit. The present season of the year is favourable to the giving out of orders for rails, and this circumstance, of course, tends to maintain rail quotations at a comparatively high point. In Germany merchants' iron is worth 9*l.* 12*s.* per ton, and small rails 9*l.* 4*s.*; but in Germany, as is well known, there are several prices—the price of foreign tenders, the price of internal competition, the price of adjudications by and for great railway companies of the Empire, &c. Plates are tolerably maintained in France at between 13*l.* 12*s.* and 14*l.* per ton. The downward tendency which has prevailed of late in the Belgian trade must now be regarded as quite at an end. There have even rumours of an advance in quotations, but this rumour appears to be on the hopes and wishes of the trade rather than on any serious and legitimate causes. Meanwhile, prices are firmly maintained at the level at which they stood a week since. Several circumstances have contributed to this firmness. First, we must mention the excessive diminution in the production, which has enabled coalowners to dispose of a considerable portion of their stocks, especially at Lidge. Secondly, we should notice the commencement of a strike in the Borinage, where the working miners are asking for an advance of 12*s.* per cent. in wages. It is also feared that the strike may extend in the Hainaut. A contract for 64,000 tons of coal for the Luxembourg lines will be let next week.

An adjudication for rails for the Berlin and Anhalt Railway has just taken place. The Heerde, Bochum, and Osnabrück works will receive the contracts for the rails in question, although somewhat lower orders were delivered by the Teplitz (Austria) Works and by Charles Cammell and Co. (Limited), of Sheffield, England. As it is intended, under any circumstances, to give the work to be tendered for to German companies, it is a pity an announcement is not made to that effect before hand.

In the French coal trade, and especially in the basins of the Nord and the Pas-de-Calais, there has been firmness, but at the same time prices cannot be said to have advanced. Colliery proprietors seem disposed to augur more cheerfully as to the future. No important contract has, however, been mentioned of late, and for the moment the requirements of consumption appear to be rather feeble. The dividend of the Hérve Bochum Company has been fixed for 1873 at 2*l.* 8*s.* per share. Of this dividend 1*l.* 8*s.* per share will be paid July 1, an interim distribution of 1*l.* per share having been made on Jan. 1. The Pontgibaud Mines Company has been paying this month an interim dividend for 1873-4 at the rate of 1*l.* per share.

THE CARIBOU MINE.—A letter (May 9) says:—At the Caribou Mine 38 men are employed in the works underground, and 17 on top. From the middle of April the mine produced 294 tons 602 lbs. of ore up to May 1, or at the rate of almost \$1000 per day. 10,325 cubic feet were opened in the mine at a cost of 60 cents per foot. The main shaft has reached a depth of 370 ft., 82 ft. below the surface. From 4 to 6 ft. in the width of the vein, with no particular pay streak, and it is now producing ore enough to crowd the works of Middle Boulder with the main shaft, and immediately thereafter the hoisting works above will be taken down on a level with the tunnel, and the original position abandoned. Con of ore thereby greatly facilitated. When this change is effected, and the capacity results in view of the present condition of things. If reports are correct, the mine near the end of the Nederland, has recently purchased a mine styled the Belcher, and a water being drawn from the mine amounts to 18 cubic feet per minute. The new "rock" being more than 100 ft. in length, and is put in line. Stopes: Canoe. A good box-work sample was taken from the old line on the 29th, but on extracting the ore on the 30th it was found to be only very moderate; although this line is so fluctuating, it is encouraging to obtain such samples. Stopping in Nos. 6 and 8 shoots has been continued without change.

May 11: The ore has again been extracted from the canoe and Nos. 6 and 8 shoots. A small quantity of box-work was taken from the canoe in the past week, but it has proved to be very fluctuating. On the 5th eight boxes of ore produced 381 lbs. of gold, but five boxes of stuff on the 6th yielded 4 lbs. of gold only, but even these occasional discoveries show that the lode contains gold to be strong. In consequence of the rise for short pass in Alice's west underground repairs, we have not been able to draw mineral from the crush this week. Sinking was continued favourably until Saturday, when we stopped the engine and changed four more of the rods, which were made of bad material.—Stopes: No change has taken place in the stopes throughout the mine since last advised.

ROSSA GRANDE.—May 10: Produce: The gold return for the month of April amounts to 1658 ozs., all particulars of which will go forward with the monthly documents. The yield per ton from the Balu is about 4 ozs.—Mine: The lode in the respective stopes in the Balu is of good size, and within the last few days that in No. 2 winze has greatly improved in dimensions; if this continues we shall show a good profit for the current month; for permanency, however, we must not look to rich shoots, but to the body of lode all through the mine, of which I need not repeat we have a good quantity. Caution: Seeing that there is no prospect of expense in this section of the property, I have hauled up the pumps, and suspended all operations here.

BIRDSEYE CREEK.—Telegram from the superintendent, Mr. G. S. Powers: "We have cleaned up after a run of 30 days. The gross returns are \$11,000. The tunnel expenses are \$1800. The profit is \$1750. I send you a remittance of \$5000."

Williamson. In concluding his report Mr. Harper says:—"I can only say that I am quite satisfied with what I have already seen, and that every assistance and information required has been readily afforded me, both by Mr. Welton, Captain Jones, and the other Englishmen in the establishment."

MINING IN AUSTRALASIA—MONTHLY SUMMARY.

THE BURRA MINE.—The half-yearly meeting of the Burra Mining Company was held at Sir H. Ayer's office on April 15, Sir G. S. Kingston, M.P., presiding. The ore obtained during the half-year just closed reached 1500 tons of about 18 per cent. of fine copper. "It will be seen (the directors write) that the value of the ore produced did not meet the expenditure by about 2800*l.*, but that deficiency was reduced to less than 1800*l.* by the receipts of rents, and was more than represented by the cost of additions to the permanent works. This result is better by 1000*l.* than was anticipated when the last accounts were rendered to the shareholders. The balance standing to the credit of profit and loss is 16,137*l.* 11*s.* 6*d.*, which, however, is subject to a reduction of 4511*l.* 6*s.* 11*d.*, being the estimated difference between the value of the ore produced and the expenses of the establishment incurred during the last 6 months." The total assets amount to 83,874*l.* 18*s.* 6*d.*, while the liabilities, exclusive of the capital, are set down at 14,552*l.* 13*s.* 10*d.*. Capt. Sanders reports that during the half-year 52,112 tons of haulage has been done; that some new exploratory works have been carried out; that a 30-inch roll crushing mill, Moonta jigger, and other dressing appliances have been erected; and that although the returns for the last half-year show a falling off, yet if we look from whence this falling off comes, the great expense in the new works for the future economical carrying on of the mine, which will soon cease, and the great drop in the price of copper, when 1500 tons of ore will make upwards of 2000*l.*, I see no reason as yet to alter the favourable opinion I hold of the future of the mine when properly opened out in depth and length. Under the present system of working, the property of the mine depends on the amount of ore ground left from former workings. Looking at the returns for the last half-year, and taking into consideration the proposed facilities for increasing the yield of ore and reducing cost, I think the mine is in a more favourable position now than in any former period since the present mode of working commenced." The directors have reverted to the old system of treating the ore after stamping, the new process known as the convex round bunnies having proved unsuccessful. The company's establishment comprises 328 men and boys, all told.

AUSTRALIAN MINES.

PORT PHILLIP AND COLONIAL (Gold).—The following telegram has been received, dated Melbourne, June 4:—"Month ending May 20, yield per ton 3 dwts. 17 grs."

Mr. Bland, April 20: The quantity of quartz crushed during the four weeks ending March 25 was 4280 tons; pyrites treated 22 tons. Total gold obtained, 802 ozs. 6 dwts., or an average new ton of 3 dwts. 12 grs. The receipts were 3743*l.* 1*s.* 2*d.*; payments (including 88*l.* paid for firewood and timber, and 32*l.* for slaking shaft), 4377*l.* 1*s.* 9*d.*; loss, 634*l.* 4*s.* 7*d.*, which deducted from the credit balance brought forward for last month of 887*l.* 10*s.* 7*d.*, left an available balance of 224*l.* 9*s.*, which was carried forward to next month's account.

BREMER.—The directors have received advices from Adelaide, dated April 23. The ore in the 103 continued, and improved in quality, yielding from 6 to 8 tons per fathom. The other ends in the mine were looking well. The new engine and Hancock's dressing-machine were working satisfactorily, and greatly reduced cost. A telegram has also been received stating that the result of the workings in May showed a profit of 250*l.* for the month.

SCOTTISH AUSTRALIAN.—The directors have received advices from Sydney, dated April 17. The sales of coal from the Lambton Colliery for the month of March amounted to 11,005 tons.

ANGLO-AUSTRALIAN (Gold).—Captain Raisbeck, April 25: I have the honour to report progress since the 24th ult.—Prospecting Shaft: We have extended the north drive to the extent of 26 ft.; the present distance from the shaft now amounts to 66 ft. I have risen up from the drive to the slope, which is now in good working order. We have broken and crushed 55 tons of stone, which gave 18 ozs. of retorted gold. I have 10 tons of stone broken ready for the mill. I should have more men employed, but the air being so foul their labour would not give satisfaction. I will employ more as soon as practicable. The tributors have driven their south drive 40 ft.; the present end is 100 ft. from shaft. In driving they broke 14 tons of stone; result, 5 ozs. of amalgam. Their run of stone is dipping under floor, and thinking it not sufficiently encouraging to follow they commenced to rise for the eastern run of stone, and have risen 30 ft. They had a strong bar of sandstone to pass through and foul air to contend with, which was very discouraging. They got through on the 15th inst. Their stone is looking very well. From the present appearance of our stopes and tributors' stone, I expect a better return this month than we have had from the shaft. Our machinery is in good working order. The following is an extract from a private letter dated April 20: "Clark will tell you about Anglo. Raisbeck says he can see his way to new expenses. He put on three more hands this morning at the instigation of John Williams, the engineer, and he (Williams) told me last week that he could then see enough to go on for twelve months and pay expenses. It is a pity it cannot be more extensively worked. The tributors are all in high spirits with their new prospects; they have done dead work for some time, and now meet their reward."

AUSTRALIAN CENTRAL (Gold).—The directors have advices dated April 20. Mr. Gill writes: "Several annoying contrivances have occurred during the past three weeks, which will delay my getting into full work, though the mine has been in a condition to receive its full complement of men since April 1, as I stated in my last. The winding engine broke down, and, though I have had it repaired, I find it so strained that I dare not, for fear of its breaking down altogether, put it to its full power, consequently I cannot employ the full number of men in the new one erected, which by this time should have been near completion. Owing to a strike amongst the saw-mill hands, no timber could be obtained till last Saturday, necessitating still further delay. I have now only 33 men underground in place of 50. These occurrences have rather upset my calculations as regards immediate profits, still I trust shortly to be in full work—say, in two or three weeks. The ground promises very well; I find there is a considerable portion of it very poor, the remainder tolerably good, giving a fair paying average on the whole. The amount of profits will depend entirely upon the quantity of dirt I can raise and wash; at present we are short of water, owing probably to its being the lag end of a very dry season; the winter rains will remedy this. If not I shall have to go to a considerable expense to find a means of conserving our waste water. The gold at the southern boundary is very fine, getting coarser as we advance north, showing clearly that we may expect some really rich ground at the upper end of the gutter. There is a considerable amount of black sand (oxide of tin), which compels me to pass the gold through quicksilver and to retort the amalgam, the process being somewhat tedious, generally occupying a full day. I deposit the gold from time to time at the bank, when I have a full parcel; I treat it at present about once a month; in future, when in full work, about once a fortnight, as the quantity of gold raised will be much greater than it is now. This plan is by far the best. I have not yet had a perfectly clean state, and as you will see by the assay note sent last mail, is worth about 4*l.* 1*s.* per ton. The suggestion of Captain Angwin, in reference to a stock of firewood and mine timber, is a very important one; unfortunately, from want of funds, I cannot adopt it. The expenditure for timber will not be far short of 2000*l.* per annum at summer prices; any addition to these prices will make a serious inroad into profits. I now stay at the mine for two or three days a week. I am thus enabled to thoroughly supervise all matters connected with it, both on surface and underground. So far as the mine is concerned, I feel satisfied as to the future, and but for the drawbacks I have mentioned we should now be making good profits." Capt. Angwin also reports, April 18, 1874:—"Owing to the winding engine not being of sufficient power to raise the dirt, the works underground have not been pushed as vigorously as I would like. The men employed at the saw-mills being on strike has caused a delay in the erection of the new one; when that is completed I shall put on a great number of men. The wash in the gutter looks very promising; yield of gold to date from 90 trucks of mixed dirt 4 ozs. 8 dwts. I consider that is highly satisfactory. In fact, the wash looks well. The only drawback I see just now is the scarcity of water; I have enough just now to puddle and sluice two machines per day. I think, with sufficient number of hands, we could get three or four. I have no doubt that when the wet season sets in the water will materially increase, and the difficulty be met. I would advise you to get about 2000 worth of mining timber on the mine before that period arrives, as it will effect a saving of many cents per ton. I consider, too, that the present appearance of the wash dirt and the yields of gold obtained from the small piece of ground, that the mine is in a very prosperous state."

FOREIGN MINES.

THE CANADIAN COPPER PYRITES AND CHEMICAL COMPANY have received at Liverpool another shipment of rich copper pyrites from their works in Canada, and they are advised of further shipments being on the way. Messrs. William Weir, of Princes terrace, Glasgow, and George Breen, of Messrs. Brydon and Breen, merchants, Glasgow, have joined the board.

DON PEDRO.—May 4: The ore continues to be taken from the canoe and No. 4 and No. 8 shoots. The mineral being taken from the crusher is at present low in quality, and if no improvement takes place we shall cease to draw from this point. Sinking during the past week has been more favourable, and the water being drawn from the mine amounts to 18 cubic feet per minute. The new "rock" being more than 100 ft. in length, and is put in line. Stopes: Canoe. A good box-work sample was taken from the old line on the 29th, but on extracting the ore on the 30th it was found to be only very moderate; although this line is so fluctuating, it is encouraging to obtain such samples. Stopping in Nos. 6 and 8 shoots has been continued without change.

May 11: The ore has again been extracted from the canoe and Nos. 6 and 8 shoots. A small quantity of box-work was taken from the canoe in the past week, but it has proved to be very fluctuating. On the 5th eight boxes of ore produced 381 lbs. of gold, but five boxes of stuff on the 6th yielded 4 lbs. of gold only, but even these occasional discoveries show that the lode contains gold to be strong. In consequence of the rise for short pass in Alice's west underground repairs, we have not been able to draw mineral from the crush this week. Sinking was continued favourably until Saturday, when we stopped the engine and changed four more of the rods, which were made of bad material.—Stopes: No change has taken place in the stopes throughout the mine since last advised.

ROSSA GRANDE.—May 10: Produce: The gold return for the month of April amounts to 1658 ozs., all particulars of which will go forward with the monthly documents. The yield per ton from the Balu is about 4 ozs.—Mine: The lode in the respective stopes in the Balu is of good size, and within the last few days that in No. 2 winze has greatly improved in dimensions; if this continues we shall show a good profit for the current month; for permanency, however, we must not look to rich shoots, but to the body of lode all through the mine, of which I need not repeat we have a good quantity. Caution: Seeing that there is no prospect of expense in this section of the property, I have hauled up the pumps, and suspended all operations here.

BIRDSEYE CREEK.—Telegram from the superintendent, Mr. G. S. Powers: "We have cleaned up after a run of 30 days. The gross returns are \$11,000. The tunnel expenses are \$1800. The profit is \$1750. I send you a remittance of \$5000."

INDEPENDENCE.—Telegraphic advices state that the May clean up produced \$4100, at a total cost of \$2700. During the greater part of the month only 10 stamps were running. The ore in the stope is improving, and 20 stamps will be kept at work through the present month.

OPHIR MINING AND SMELTING COMPANY OF UTAH.—The directors of this company, which was privately formed, and was the first set of English adventurers that started in Utah, have received the subjoined report from the manager:—

MINERS' DELIGHT (Utah).—May 10: I have all the water out, and have made 6 ft. progress in the incline, and am now more convinced than ever that we are near the great body of galena ore. The whole face, sides, top, and bottom are in solid mineral, and but little pyrites in it; if we had jaggers convenient to the mine this would pay to work alone. By the same mail as this I send you a specimen taken from the face to day.

May 12: I have everything going on well, and our prospects brighter than ever. I have three shifts on, and all the men are wild with excitement about the way the face looks.

DEFIANCE MINE (Ophir City).—April 30: You will be pleased to hear that we have struck a seam of rich ore that looks most promising. Copy of letter from the assayer: The sample you left with me contained 6 dwts. of lead, and 30 ozs. to the ton of 20 dwts. This is lead ore or an ore of fine associated with it, which causes it to be poor, but if properly dressed, as is done in all lead mining, the quality would be increased nearly three times. Notwithstanding this, the result is very gratifying, and proves that all that Blackwell has advanced has been correct.

LONDON AND CALIFORNIA.—Telegram from the Agents: "Struck ledge Prospect shaft—so far as developed 3 ft. thick—very rich."

MINERAL HILL.—Mr. Oakes, superintendent, May 18: We have raised during the week 60 tons of ore, of an average grade of 50 per cent. at a mine cost, including stores, materials, and sorting waste dumps, of \$500 40.

RICHMOND.—Cable from the mine: "Week's run, two furnaces, \$34,000." Information has reached the board that the tunnel from the main shaft has struck the great lode, and that the third furnace would be started shortly.

BRENSBERG.—E. Craze, June 6: Victoria Shaft: There is no change to notice here since my last. The lode in the level east of new shaft is a little improved, now worth 1 ton of ore per fathom, with a promising appearance for further improvement. There are two pairs of men put to stop the back of level east and west of new shaft; each stop will produce 3 tons of ore per fathom. We have put two men to drive in the ore ground in south east side of open cast; at present this point looks promising, and the lead is more free of pyrites than most other parts of the mine. There is nothing new in the stope in north east side of open cast. The men in the western stope of open cast are laying bare the carbonate for June delivery.

PESTARENA.—Thomas Roberts, June 3: District Val Toppe: The end south in No. 4 level advanced in May 630 metres, and has been reset to six men, for June, at 70 frs. per metre. The balance continues to underlie eastward toward the bottom of the end; it is about 18 in. wide, composed of quartz, with magnetic iron, pyrites, lead and blende ores. We have made several trials of the ore from this end, one of which gave after the rate of 9 dwts. 5 grs. per ton, and the others traces of gold. In the last two days we have noticed spots of gold in the quartz coming from the end. On the whole, the appearance of No. 4 end south is more encouraging at the present time than we have ever before seen it. The end of No. 5 level was driven in the last month 505 metres, and is now set to five men, for June, at 62 frs. per metre. The channel in this end has again taken its course, but is rather pinched.—District Battigio: Some repairs have been done to the footpath leading to the adit, and the Kibasso Tasso level was resumed on June 2, by two men, at 30 frs. per metre.

PONTGIBAUD.—W. H. Rickards, June 1: Ruure: The sinking of the engine-shaft goes on favourably, the ground having become easier than for some time past.—Virginia's Lode: The 80 metre level north is in hard wet ground; the lode is composed of quartz, spotted with ore. The same level south is in soft, discoloured ground, and the lode unproductive. The 60 north is ore. The 40 south yields 1½ ton of ore per current metre. The same level north is poor. The 20 winze north yields a little saving work. The trial cross cut east is being driven rapidly, in favourable ground. The adit south yields a little low-quality saving work, and the same level north opens tribute ground worth ¼ ton of ore per metre.—Mill Shaft: The 20 metre level south has entered the run of productive ground, and promises to lay open good ore; this end has produced a little saving work for the last few days. The lode in the adit, where being stripped down, yields ½ ton of ore per current metre.—La Grange: The 120 metre level north yields saving work. We have set to rise behind this end, to communicate with the winze in the 100. The intermediate level below the 80 yields ½ ton of ore per metre.—La Brousse: The 140 metre level south is unproductive, the lode being discoloured by a slide. The 120 south yields ½ ton of ore per metre. The 100 south yields ½ ton of ore per metre. The stripping down of the side behind this end yields 1½ ton of ore per metre. The 80 metre level south continues poor. The rise in the back of this level is in speedy ground. The 60 is in a large soft lode, unproductive. The stripping down of the lode in the 40 south yields ½ ton of ore per current metre.—Pranal: The sinking of St. George's shaft continues difficult; the ground is still very hard and wet. The 70 metre level north yields 1½ ton of ore per current metre. The 50 south has resumed driving—lode poor. The 30 south below this level yields ½ ton per metre. The 30 south has entered a run of ore ground, which promises well; the lode is large and strong, yielding ½ ton of ore per current metre. We have resumed the driving of the trial cross cut west, in the 8 metre level, hoping yet to find something in that direction. Our stopes and tribute pitches throughout the mine generally maintain their usual yield.—Surface: Our surface operations have gone on regularly—the results are 276 tons of ore.—St. Amant: Our operations here are being carried on with the usual activity; there is no particular change to report in the ends since our last.

[For remainder of Foreign Mines see to-day's Journal.]

GOLD IN NEW ZEALAND.—A letter from Graham's Town, April 10, says:—"From the following gold returns, from March 15 to April 10, it will be seen that there is an increase in the yield of gold of 2255 ozs. Stone crushed, 7292 tons 4 dwts. 83 lbs.; gold, 11,626 ozs. 5 dwts. 3 grs.—previous month, stone crushed, 6165 tons 11 dwts. 8 lbs.; gold, 8340 ozs. 10 dwts. 6 grs.; increase, stone crushed, 1026 tons 13 dwts. 75 lbs.; gold, 3245 ozs. 5 dwts. 21 grs." The *Times* *Advertiser* of April 10 says:—"The prospects of the gold field never looked brighter than they do at present, even at the time when the Calveonian and other exceptional mines were producing very heavy yields, for now the gold is more generally the result of crushings from all parts of the field than at any time previously."

GOLD IN INDIA.—The reef now being worked in the Wynaad, by Mr. G. E. Withers, for the Alpha Gold Mining Company, will, the manager states, turn out on the average as well as any reefs in Australia, provided it be properly worked. There are now 3000 or 4000 tons of stone at surface, awaiting machinery for crushing, and which he is convinced will yield a handsome return. The *Bombay Gazette* remarks that should this prove correct there is no saying what effect the result may have upon the future of that and many other parts of India.

BRITISH COLUMBIA GOLD MINES.—The Hudson Bay Company's steamship Otter, which arrived at Victoria on May 4 brought two gentlemen direct from Dease Lake Mines with very encouraging news. They left the mines on April 15, left Buck's Bar, per canoe, on the 21st, travelling down the river, entirely free from ice, and arrived at Fort Wrangle on the 23d. At Dease Lake there was still plenty of ice, but all the snow was off the lake. The men were thawing the ground, and taking out dirt paying from 37 cents to 50 cents and 75 cents to the pan. Several companies were also taking out from \$25 to \$50 per day to the hand with rockers. At the mines there were upwards of 500 men, and the rush to these mines was such that it was thought there would be some thousands in the district by midsummer.

LA MINERIA ESPANOLA.—The report of the director-gerente (Senor Don Ceferino Aveilla) prepared for presentation to the shareholders at the ordinary general meeting, is decidedly encouraging. A slight accident in the lower part of the pumping shaft necessitating careful strengthening of the timbering, and the large flow of water since from the new and important discoveries which have been made, have prevented progress in depth, but considerable work has been done in driving, about 1225 metres of ground having been wrought to the surface now being worked, and galleries have been put out over the newly discovered veins. The aggregate production for the year amounted to 4,484,385 rvs., and the total outlay was 3,165,479½ rvs., leaving a profit of 1,318,905½ rvs., equivalent to 29½ per cent. of the total production. The expenditure upon plant account has been heavy during the year, and included the removal of the winding-engine from Basilisa shaft to that of San Miguel, the construction of tramways in the works, and the survey of a line from Horeajo to Veredas. The opening up of the mines of Veredas will be delayed for some time, as the important discoveries at el Horeajo afford a field for operation claiming more immediate attention. The road from the port of Lues will have to be weighed with the project for constructing the railway from Veredas to the Horeajo, and the building of the church at the Horeajo and the extension of the store at Veredas, are of more imperative necessity. The director-gerente states that he has transcribed the particulars as to the practical working of the mines from the report of their *Intendente y laborioso ingeniero*, Senor Don Alfonso Piquet, and that gentleman may certainly be congratulated upon the marvellous accuracy of his estimates. He estimated that he would work 9300 metres of vein stuff, and actually worked 9074½ metres; and his estimate of the value per cubic metre was still closer, being 403 instead of 405. With regard to the prospects of the present year, it appears that there will still have to be considerable expenditure on plant account, as it is necessary to substitute a 30-horse locomotive for the present 12 horse; a 50 horse pumping engine is required at Nuevo Peru; and one of 80 horse power at Posada. The yield for the present year is estimated at 52,500 quintals, worth 8,825,000 rvs. Of the profit of 1,350,000 rvs., 10 per cent. was appropriated by the director-gerente; 10 per cent. to the reserve fund, and a dividend of 200 rvs. per share on the 5400 shares issued was declared.

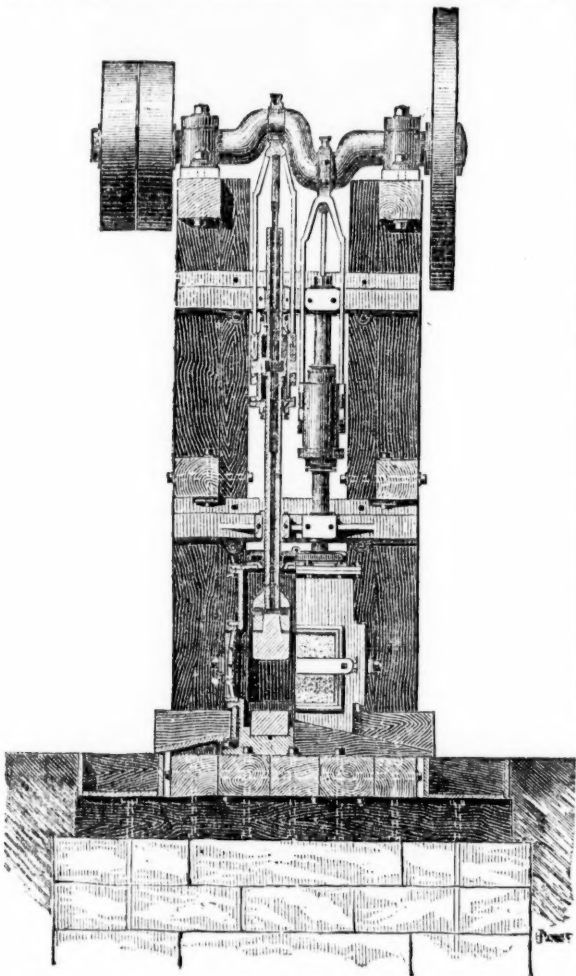
PATRIOTISM IN A POCKET.—Messrs. Chas. Cammell and Co. (Limited) Sheffield, have tendered unsuccessfully for the supply of rails for the Berlin and Anhalt Railway. Their tender was lower than the tenders of their German opponents, but the latter secured the contract on the ground of nationality.

PHOSPHORISED STEEL.—At a meeting of the Society of Civil Engineers in Paris, M. Euverte, director of the works of Terrenour, explained the present state of the manufacture of phosphorised steel. It was not, he said, a question of purposely introducing the phosphorus in iron which did not contain it, but of how much might be left in without damage. From experiments made, it appeared that phosphorus might be introduced into cast-steel on condition of eliminating the carbon; the less carbon left, the more phosphorus the compound might have. Steel containing about three and a half thousandths of phosphorus and one and half thousandths of carbon was very malleable, and furnished rails of excellent quality, which lasted five or ten times as long as iron rails. It was reckoned that there were 3,000,000 tons of old iron rails in France, 6,000,000 tons in England, 10,000,000 tons in America, and 10,000,000 tons in the rest of the world capable of being transformed into the new steel.

CURE (THIS WEEK) OF OLD STANDING ASTHMA, COLDS, &c., BY DR. LOCKE'S PULMONIC WAFERS.—From Mr. Robinson, chemist, Trinity-street, Hull: "June 8, 1874: In all affections of the chest, old standing asthma, and neglected colds, they seem to act like a charm." In asthma, consumption, bronchitis, coughs, colds, and rheumatism, they give instant relief. Sold at 1*s.* 1½*d.*, 2*s.* 4*d.*, 4*s.* 6*d.*, and 1*l.* per box.

ECONOMIC ORE STAMPING MACHINERY.

Whilst almost innumerable improvements have been introduced in nearly every description of machinery used in connection with mining operations, it is somewhat remarkable that, except in a few isolated cases, the antiquated form of stamps in use a couple of centuries ago are still employed, and with but very trifling modifications. The old average rate of 1 ton per stamp-head per day has still remained without variation, and many of the alterations proposed have been anything but improvements. The necessary result is that there is not only an enormous consumption of time in preparing the ore for market, or for subsequent treatment, as the case may be, but much extra outlay is also incurred in keeping up a larger fixed establishment than would otherwise be required. The motion of the old stamps-head being produced by means of a cam, the greatest speed that can be relied upon is from 50 to 60 blows per minute, but in the PATENT PNEUMATIC ORE STAMPING MACHINE represented in the subjoined diagram, which was invented a few years since by Mr. Husband, and is now largely manufactured by Messrs. Harvey and Co., of Hayle, this difficulty is entirely overcome by using a cranked axle for the working axle, and lifting direct therefrom, avoiding all deleterious vibration by the introduction of a pneumatic collar on the lifting rod. The new stamps appear to be giving great satisfaction in Cornwall, and several are now in course of construction for shipment to the Australian gold mines. Instead of the old speed of 1 ton of ore per head per day, the pneumatic stamps reduce from 7 to 10 tons per day, at 145 blows per minute, or about nine times the quantity on the average, so that the considerable saving that would be effected in the amount of wages payable for superintendence will be readily understood.



The pneumatic stamping machine is exceedingly portable, which is a very great advantage; it can be taken to pieces, carried to any part of the mine, and erected, with its portable engine, in a few hours, requiring no foundation, the large outlay required for the erection of the old stamps being saved. A small battery may be used for prospecting purposes, and worked by horse or by bullock power whenever it might be desirable to do so, the whole machine being made sufficiently portable for loading on a bullock dray. When required for permanent use it may be readily fitted with a pulley, and power applied by means of a band, which will then possess all the advantages of a larger size machine. In difficult or mountainous countries, where transport is expensive and dangerous, it is desirable that every part of a machine should be as light as possible, in order that it may be carried by mules, or drawn by oxen. By the substitution of wrought-iron for cast-iron, wherever practicable, two important advantages are obtained. In the first place, the risk of breakage is reduced to a minimum; and, secondly, the weight is so reduced that the cost of transport is materially decreased. As to the non-liability of the pneumatic stamps to get out of repair, it need only be stated that Messrs. Harvey and Co. undertake to keep them in order for 15 per cent. less than the ordinary cost incurred in Cornwall where the old system of stamps is used, the estimate, of course, being made upon the ton of stuff stamped.

But the superiority of the pneumatic stamps will be best judged of by a comparison of them with stamps of the old form. The old stamps, as already stated, give about 60 blows per minute, whilst the pneumatic stamps give from 140 to 145, the former stamping 1 ton per head in 24 hours, and the latter 7 to 10 tons in the same time, according to the hardness of the ore. The weight of the old head and lifter is about 6 cwt., whilst that of the head and lifter of the pneumatic stamps is but 2½ cwt., but the blow of the latter is equally effective, because the average lift of the old stamps is but 9 in., whilst that of the pneumatic stamps is from 16 in. to 18 in. The combined result of the various improvements is that whilst the weight of iron in a machine of 20 heads on the old system is about 20 tons, it is but 4 tons when the pneumatic principle is adopted. In some experimental trials made at Hayle by Capt. Quantrell, of Trumpet Consols, Capt. S. Harris, of Great Wheal Vor, and Mr. G. Eustice, jun., engineer, one head weighing 310 lbs. was worked without intermission at a uniform speed of 180 blows per minute. The tinstuff stamped was from the Great Wheal Vor, of their average hardness and size, which we believe to be about the average of the county. The quantity stamped (to a proper size) was 21 cwt., which occupied 2 hours 15 minutes, or equal to 11 tons 4 cwt. in 24 hours, and which is at least ten times that stamped by the ordinary stamps of the county. Throughout the trial it worked in every respect satisfactorily, and at its conclusion every bearing and part was quite cool, and in perfect order. In subsequent trial, at Wheal Lucy, 5 tons 5 cwt. of blue elvan tinstuff, of the toughest and hardest nature that could be selected in the mine, or equal in hardness to any in the county, was carefully weighed out and put into the stamps, which consisted of two heads only, and in six hours the whole of it was passed through the grates, of a fair average size, being at the rate of 21 tons in 24 hours. Taking three months working of these stamps at Wheal Lucy, it was found that they averaged 10 tons per head per 24 hours. Each head, when new, without lifter, weighed about 84 lbs., and it was worn down to 50 lbs.,

and renewed in about a month; the three months work had worn in the aggregate about 112 lbs. of iron off the stamps-heads.

The compactness of the new stamps is a further recommendation. The area of ground occupied by these stamps, with complete bed and pass, is only about 8 ft. by 5 ft., and they might be removed bodily to any other part of the mine in a few hours, if it were thought desirable to do so. These stamps are fitted complete with cast-iron coffer and grounds, leaving nothing to be done on the mine; yet the first cost for a given stamping power is less than with the old method. No doubt the greatest improvement introduced in the pneumatic stamps is the adoption of a metallic piston, the friction being thereby reduced to an almost inappreciable amount, and which cannot be increased by any increase of pressure within the cylinder; it is also extremely durable, and easily renewed. It is a very general opinion, moreover, that the tin is discharged from the coffer in a better condition than with the ordinary stamps, for the fact is established that, owing to the quick motion in the coffer, the tin when separated from its matrix has no time to settle, and so be crushed to slime, but is discharged as soon as it is reduced to the required size to pass through the grate, consequently most of the tin is found at the head of the strips, and much less passes off in slimes than with the old method of stamping; this result was confidently expected, and has been entirely realised. Capt. John James, of New Rosewarne, estimates that in first cost and erection the saving of time and cost is quite 50 per cent. as compared with the old plan, and he adds that they are very simple in construction, and require no skilled labour to work them. Mr. Pagan, the engineer of the Tretoil Mine, states that they find that with a speed of about 140 blows per minute they can with 8 heads stamp, on an average, 50 tons of stuff per day down to a very small size, after allowing for all ordinary stoppages, such as changing of heads, &c., and that it is as much, if not more, than could be done by 70 of the old fashioned stamps. As compared to the cost of keeping in repair 70 of the old heads, the expenditure required for these eight is a mere trifle. They have had no trouble with them, and have only had two slight breakings, which were of no importance, as the parts which gave way had to be simply taken out and replaced by new ones, it being their practice to keep on the mine a supply of such parts as are at all likely to break, so as to be ready for an emergency. The great point to be looked at in working these stamps is not to work them beyond the speed they are designed for, and to be careful that they are kept properly oiled, and the water passage free, so that there is no heating. If this is attended to their management is a very simple affair, and no one can, Mr. Pagan thinks, be anything else but satisfied with them.

The pneumatic stamps have now had about four years thorough practical trial in a large number of Cornish mines, and really appear to leave but little room for further improvement, so that with the present improving prospects of the tin mining industry, and the consequent probability that many mines which have been idle will be reworked, and that new machinery will be erected upon them, it is but reasonable such inventions as these will be extensively availed of, as the surest means of making the mining operations undertaken remunerative to those engaged in them.

THE BROUGHAM CAB.—It is somewhat remarkable that in London, where facility for locomotion is of paramount importance to a large number of individuals who would willingly pay extra for additional accommodation, it is extremely difficult to find even a decent public conveyance in the shape of a cab or omnibus, although in many country towns and cities one meets with light and elegant little vehicles, which, at no higher fare, quickly perform the service required of them. In one or two places in the Midland Counties we have noticed that the cabs which appear to meet the most general approval are those manufactured by Messrs. JOHN MARSTON and Co., of Bradford-street, Birmingham, which, although attractive in appearance and causing no distress to the horse, are substantially constructed, and well adapted to stand a large amount of hard wear.

It is, therefore, gratifying to know that this firm was awarded a gold medal for their exhibit at the London International Exhibition. Marston's hansoms are particularly comfortable and roomy, although they are extremely light and by no means excessive in price; whilst, with regard to the brougham cab, it is certainly the best style of front that extends to the roof, a door opening on either side. The doors, like those of a brougham, are half-glazed and handsomely furnished with silk curtains, and the rider may raise or half raise the windows at his pleasure. In fine weather there is a pleasant look-out, and plenty of fresh air, whilst in rain the windows may be sufficiently closed to ensure snugness and dryness without in any way interfering with the ventilation. Only a few weeks since Messrs. Marston obtained a prize at Manchester for improvements in hansoms cabs, and we do not doubt that if the vehicles were more generally known they would be much more extensively adopted.

MECHANICAL EXCAVATOR.—The invention of Mr. DAVID ROWAN, of Glasgow, consists in the construction of an excavator, for digging and lifting, or dredging earth, small stones, and water out of the centre of iron and other cylinders while sinking them for foundations, or for sinking wells or pits, or for other dredging purposes,—in a hollow semi-circular or bowl shape below, and open above, in four or other number of doomed sectional plates of iron or steel, jointed loosely and close at their edges, each formed with strong ribs inside, jointed near their upper edge to the lower ends of sustaining arms fixed to the lower end of a hollow spindle, which carries the whole excavator while lowering it by a chain and shackles attached to it direct or to a sliding collar on it and a weight coming against a fixed collar at the top, which collar when used has links attached to a continuation of the ribs up beyond the oscillating sections, so as to tilt their points out vertically when lowering as diggers, assisted by the weight of the solid lifting bar, working loosely within the centre of the hollow lowering bar, and actuated by a lifting chain above and by a link at its lower end, to near the point of each sectional digger, so as to force them out to the vertical digging position, with great power by their whole weight when the lifting chain is slack, and they are turned on the carrying arms of the hollow lowering spindle, and drawn in again to the bowl shape with great force by the lifting chain and central spindle and link attachments to their points (when the lowering chain is slackened), so as to enclose and lift the earth or other substance being excavated or dredged. These chains may be actuated by the ordinary chain barrels of hand or steam winches, or crabs and cranes, the one chain being left slack when the other is carrying the excavator.

METHOD OF ASSAYING LEAD ORES.—The ore or other substance is oxidised, and its metals converted into sulphates before reduction; the best agent for this purpose being sulphate of ammonia. The ore is mixed with an equal or double weight of sulphate of ammonia, according as it is supposed to be poorer or richer, and the mixture is ignited in a small crucible of porcelain, covered to prevent spitting. The mass, when cold, is treated with boiling water, acidulated with sulphuric acid and muriatic acid. By this means the sulphates and oxides of iron, copper, &c., are dissolved, while the lead and silver remain insoluble. This portion is washed by decantation, the washings being passed through a filter. This portion is next dried, and its ashes added to the dried insoluble portion. It is then mixed with muriatic acid and powdered zinc, in order to reduce the sulphate of lead and the chloride of silver. The metallic deposit is washed with water which has been boiled, or acidulated with sulphuric acid, and is then pressed into a compact mass. This is dried and heated with from 1½ to 2 parts its own weight of a flux composed of 13 grammes carbonate of potassa, 10 grammes carbonate of soda, 5 grammes of melted borax, and 5 grammes of farina. The whole is covered over with dried chloride of sodium, and the heat is raised by degrees to redness. When the whole is in a state of quiet fusion it is submitted for a moment to a higher temperature. This process serves for determining lead and silver in white lead, red lead, ores rich in gold and silver, also antimony, tin, copper. If, in the assay of ores of gold and silver, the amount of lead is insufficient, pure oxide of lead is added. —*Chemical Review.*

BREAKFAST—EPPS'S COCOA—GRATEFUL AND COMFORTING.—By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. —*Civil Service Gazette.* Made simply with boiling water or milk. Each packet is labelled—"JAMES EPPS and Co., Homoeopathic Chemists, London."

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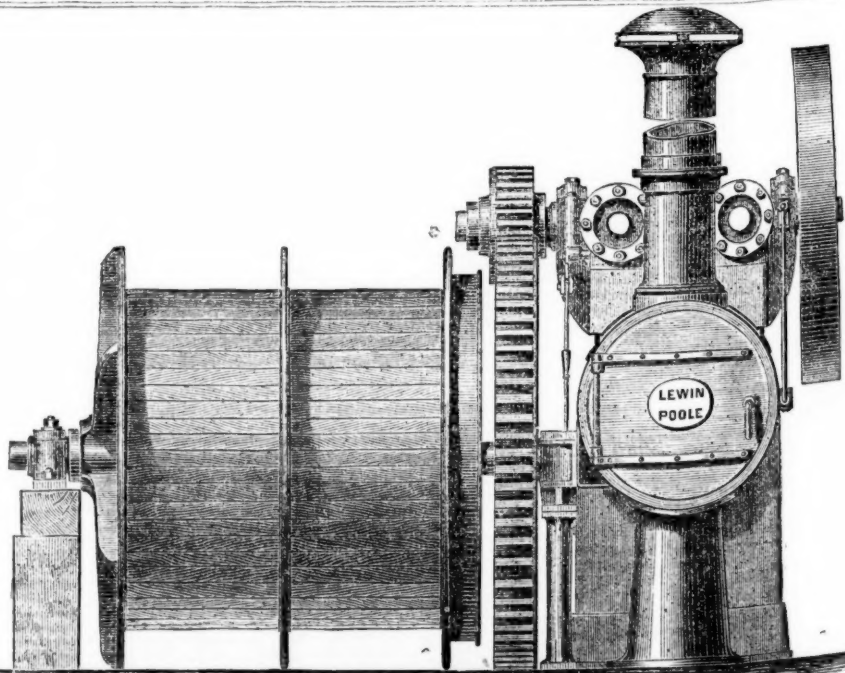
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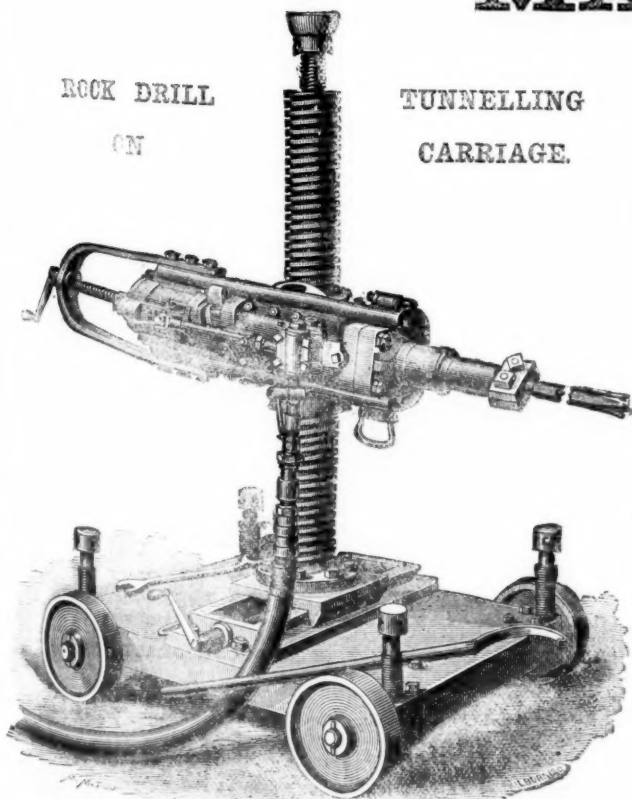
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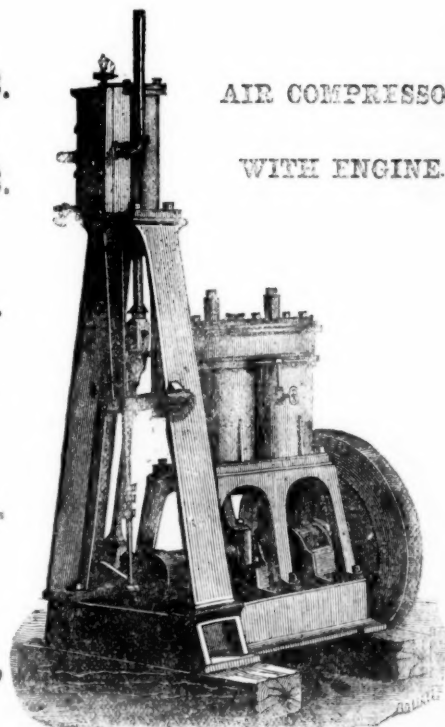
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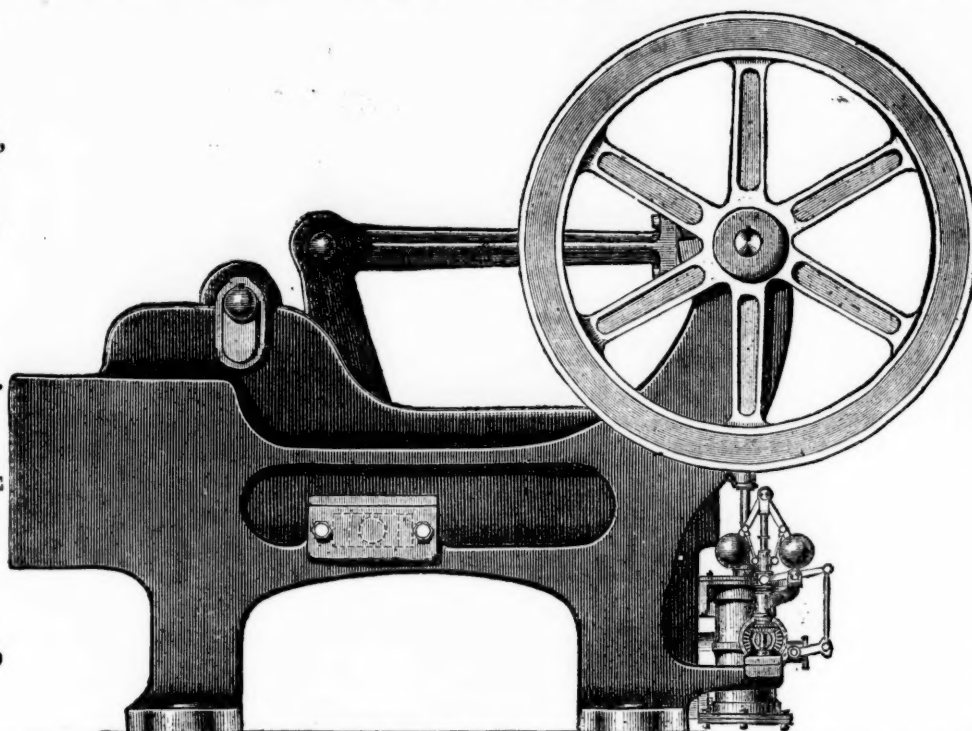
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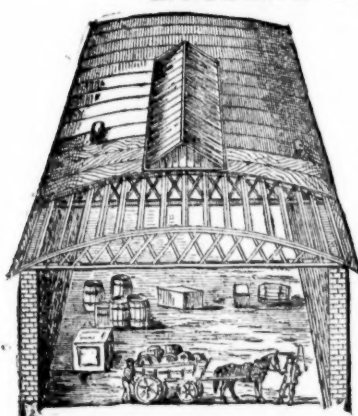
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